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A SURVEY OF EDUCATIONAL RESEARCH AND AN APPRAISAL BY SCIENTISTS FROM OTHER FIELDS.

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THE OBJECTIVE OF THIS SURVEY WAS TO OBTAIN A DESCRIPTION OF EDUCATIONAL RESEARCH AS PERCEIVED BY EDUCATIONAL RESEARCHERS. A QUESTIONNAIRE WAS USED TO STUDY THE ATTITUDES, IMPRESSIONS, AND IMAGES OF EDUCATIONAL RESEARCH THAT ARE HELD BY GRADUATE STUDENTS, FACULTY, AND DEANS. A STRUCTURED INTERVIEW WAS ALSO USED TO STUDY THE ATTITUDES AND PERCEPTIONS OF EDUCATIONAL RESEARCH HELD BY THE FACULTY AND DEANS OF EIGHT SCHOOLS SELECTED AS OUTSTANDING. AN ATTEMPT WAS MADE TO ASSESS THE RESULTS OF THE SURVEY BY MEANS OF DISCUSSIONS WITH SCIENTISTS FROM OTHER FIELDS. (TC)

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

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INSTITUTE OF EDUCATIONAL RESEARCH
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CHAPTER I BACKGROUND OF THE STUDY

Problem:

The present study was concerned primarily with two kinds of problems: 1) What images of educational research are held by educational researchers; 2) What congruences exist between the perceptions of research by educational researchers and those of scientists from other fields. Problem 1 is the subject of part I of the present report, chapters 2-6; problem 2 is the subject of chapter 7.

In the first part the problem was to obtain a description of educational research from those involved in educational research. As in surveys of this kind, the specific problems are described by the questions that are asked. In the questionnaire and interview studies no attempt was made to identify educational researchers a priori, or to indicate the limits of the spectrum called educational research. It was thought that a more representative picture might emerge by having the people identified by their deans, colleagues, or themselves.

No single hypothesis was proposed as is the case in an experimental type of study. A survey of the state-of-the-art at a given time does not lend itself to a simple hypothesis that can be succinctly stated and neatly tested by data collected under controlled conditions. This was a descriptive, observational, type of study designed to reflect the image of educational research held by those who were deemed to work in the enterprise. Tests of significance were applied where the data seemed to warrant them. No scaling or refined treatments were applied to these data.

Problem 2 is the subject of chapter 7, which is a summary of discussions held with specialists from other fields, especially the area of the logic and history-of-science.

Outline of the Discussion:

Problem: To obtain a description of educational research as perceived by educational researchers

I. Part I Study:

  A. Questionnaire survey of attitudes, impressions, and images of educational research held by:

(cont'd)

1. Deans and faculty -- chapter II
2. Graduate students -- chapter III

B. Structured interview survey of faculty and dean's attitudes and perceptions of educational research in the eight schools selected as outstanding -- chapter IV

C. Summary of faculty publications -- chapter V.

D. Summary of doctoral theses -- chapter VI

II. Part II Study was concerned with an attempt to assess results of Part I by means of discussions with scientists from other fields -- chapter VII

Procedure and Data for Part I

An input-process-output model was used as the general blueprint of the Part I study.

INPUT-PROCESS-OUTPUT MODEL OF EDUCATIONAL RESEARCH
(Rationale for the study of educational research)

Input

1. Qualified personnel in sufficient number
2. Funds
3. Space
4. Equipment, facilities, hardware
5. Climate supportive of the activity
6. Administrative facilitation

Process

1. Outside speakers discuss their research with faculty.
2. Graduate students participate in the research of faculty members.
3. Time and effort spent by faculty on research of their own. Kind and amount of research activity.
4. Faculty members seek to improve their research skill and understanding through study at summer institutes and during sabbaticals, original research resulting in publications. Faculty members maintain learning attitude and competence throughout their career.
5. Faculty members who speak up for and actively support inquiry and scholarship.

6. Faculty appear on interdisciplinary teams; Are members of an academic as well as a professional department; Are on professional programs, publish in research journals, members of academic societies

Output

1. New knowledge, new generalizations, new organizations of existing knowledge.
2. Publications, papers.
3. New tools techniques
4. Qualified students.
5. Suggestions for new data, new ways of seeing the familiar.
6. Ratio of number of students going into Research relative to those contributing to Research publications

Topics to be Covered by Items:

1. Climate or freedom for inquiry.
2. Encouragement of Research:

    a. By colleagues.
    b. By administration.

        (1) Salary, promotion, tenure and sabbatical leave are influenced by research.
3. Interest in Research:

    a. By faculty in doing research.
    b. By faculty in their colleagues' work.
    c. By faculty in research of others.
    d. By administration.

        (1) Administrators speak out for and seek support of research
        (2) Administrators plan faculty research seminars.
4. An expectation of faculty research performance.
5. Time spent in research by faculty.
6. Preparation of faculty members to do research.
7. Facilities provided by institution for research.

    a. Reduced teaching load.
    b. Space for research.
    c. Equipment for research.
    d. Library facilities.
    e. Consulting help.
    f. Graduate assistants.

8. Internal funds for research provided by institution:

    a. For research costs
    b. For travel to other research centers or to meetings
    c. For clerical assistance

9. Funds for research from outside sources-contracts, grants, etc.
10. Research outpur of faculty:

    a. Studies in progress.
    b. Past publications-number and source.
    c. Demand for faculty members as speakers at research meetings.

11. Graduate training in research.
12. Organization for research.
13. Appraisal of status or importance of educational research

Items were generated using the above outlines as guides. For the questionnaire study a pilot study was done using first draft of the questionnaires (See Appendix C for Faculty and Appendix D for graduate student questionnaires). Results were analyzed and revisions were made. About 1100 copies were sent to faculty members at each of 93 schools offering a doctorate program in education, and 52 per cent (or 573) returns were received. A random sample of one-third of these was taken for detailed analysis. Frequency distributions of results, comparison of administrator and faculty responses, and bivariate comparisons of responses to each item with response to all other items were made. Results of the faculty questionnaire are summarized in Chapter II. Chi-square tests of significance indicate no more differences were significant than might be found by random samp,ling alone.

Copies of the Graduate Student Questionnaire are given in Appendix D. A pilot questionnaire form was tried out on 50 students at two schools not included in the study. Results were analyzed and items revised. About 2500 questionnaires were distributed to graduate students through local chapters of Phi Delta Kappa. Arrangements previously had been made with the International Headquarters and chapter presidents to distribute the questionnaires to graduate students. Responses were mailed directly to the project in the self-addressed stamped envelopes provided. Approximately 650 or 26 per cent returns were received. A random sample of one-half of these was taken for detailed analysis. Frequency distributions of responses, comparisons of Ed. D. and Ph. D candidate responses, and bivariate comparisons of responses to each item with all other items were made. Results are summarized in Chapter III. Chi-square tests of significance indicate no more differences were significant than might be found on a random sampling basis alone.

Administrator and faculty interviews (Chapter IV) were carried on at eight schools selected because they were outstanding relative to 1) amount of research and writing, 2) estimated level of research performed, 3) faculty, 4) size. Selection was based on empirical and judgmental data. Items 1 and 4 were obtained empirically; items 2 and 3 by judgments made from (a) nominations made by officials of AERA who were individually interviewed, and (b) members of the Research Advisory Panel who were individually interviewed.

Rankings were obtained on all four criteria, added, and then these sums were arranged in rank order. The top eight institutions arranged alphabetically rather than in rank order were:

California, Berkeley
California, Los Angeles
Chicago
Harvard
Michigan
Minnesota
Stanford
Wisconsin

Arrangements were made to visit these schools and interview administrators and faculty, designated by administrators, as most active in research. It was possible to visit only seven of the eight schools. The administrator's schedule contained questions directed toward facilities available for research; the percentage distribution of funds allocated for teaching, research, consulting and other public services; the percentage distribution of faculty time among teaching, research, and service activities; the climate provided for encouragement of research, and the names of faculty members most active in doing research.

The faculty schedule contained a block of questions relative to the problem he was working on (or had recently completed). Items also were included relative to "what is educational research?"; the criteria useful in distinguishing outstanding research; what is appropriate preparation for educational research (selection of people, course requirements, on-the-job experience in research, etc.) Approximately 154 interviews, varying in duration from 20 minutes to almost two hours were obtained.

The procedure was started with the dean's office. A faculty researcher list was prepared, after the interview was completed. Appointments were made with these faculty members. It was planned to tape record all interviews, but this did not prove feasible because of equipment deficiencies. Almost one-third, however, were tape recorded. A summary of results was made impressionistically by reviewing the notes and noting observed trends.

Faculty Publications Study

Faculty publication listings were obtained in two ways: (a) the dean was asked for a list of faculty publications of the previous year, and (b) twenty professional journals carrying educational research articles were examined for the five-year period, 1955-60. Each article that dealt with empirical or analytic concerns, was listed individually on a 3 x 5 card--author, school, title of article, journal, and a brief summary. Cards were manually sorted to provide the results given in Chapter V.

The top one-fifth of schools produced more than one-third of all publications. No assessment of quality was attempted but the general impression of the tabulators was that the more frequent publishers tended to have the higher quality. A distribution of publications in the area of teacher performance is presented because data appear to be most nearly complete there. Frequency of articles increased steadily until 1929-32. Then a decline, probably associated with the depression and World War II set in. The frequency did not catch up until 1954, if one extrapolates.

The final tabulation indicates the frequency of publication by each institution offering doctoral work in education.

Doctoral Theses:

Chapter VI presents results of the doctoral thesis study. Topics under which titles were listed were those found in Research Studies in Education, Phi Delta Kappa, 1953. Topics found in the 1954-57 editions of this publication were rearranged to fit these categories.

Results are summarized under topics for the entire group, and for each institution.

Review of Literature

As a result of Sputnik and a series of frustrations increasing attention is being directed to educational research by the American Educational Research Association, Phi Delta Kappa, the National Research Council "Organization for Research in Education" (ORE), the U.S. Office of Education "Cooperative Research Program" as well as organizations of school administrators and teachers. Educational research is important to these groups, since they recognize that improvements in educational practice come most dependably from educational research.

The shortage of engineers, scientists, and others with adequate technical training reflects parallel educational research problems. When nature cannot supply enough top level personnel, education and/or training are called upon to take care of the deficiency. If we do not have enough top level ability people who can master the intricacies of modern technology under present educational conditions, our national interest requires us to raise the standard of educational achievement for those of lower ability. The National Science Foundation attacked one part of the ensuing task by supporting the development of science and mathematics instructional materials, upgrading of high school faculties, laboratory resources, etc., and, as a stop-gap these measures were helpful. However, even in the context of mastery of given content these plans take too little cognizance of the more basic problem-the nature and conditions of learning surrounding mastery of the content, and development of the requisite intellectual skills for adequate performance.

Improvements in education can most dependably come through competent educational research. There is no other dependable means available.

The discussion so far ignores the arts and humanities. It would be most unfortunate to leave the impression that educational research should be directed only toward the technological aspects of our culture. The problems of making life worth living in an increasingly complex technological world are probably greater than those directly associated with the technology itself.

Need for study: A large number of surveys of educational research-indexes, annotated bibliographies, and various enumerative studies of personnel and topics-exist at the present time.

However, available studies do not contain the specific information needed to describe what is educational research, or what is its present scope. At the present time, we do not have data that would permit competent researchers to judge the level of activity in education and discuss desirable lines of future development.

Background: Phase I of the proposed study was designed to help provide an operational definition of current educational research in terms of the perceptions of the relevant activities by educational research workers. Phase II of the study was designed to assess the information collected in Phase I by dialogues with colleagues from other fields.

A variety of opinions exist as to the nature of educational research. One pole of opinion contends that education is like medicine: saying it is an art rather than a science. The fund of basic knowledge is supplied by the related areas of psychology, sociology, cultural anthropology, linguistics, physiology, economics, etc. This group of opinion sees educational research activity as primarily developmental rather than as research. Educational research takes the findings of the related academic disciplines and adapts them to the classroom or school system. Another pole of opinion insists that findings of the related academic areas are interesting but so remote from the requirements of the classroom or school as to render them virtually irrelevant. This group insists that basic research needs to be done within the distinct and unique context of education.

The present study was begun because it seemed to be desirable to know what researchers said was and was not educational research, and what was their reaction relative to the nature and scope of their research activities.

The second justification for the present study was that data were needed to explore the role of research in education.

Writings of psychologists and sociologists are typically more concerned with the level of scientific maturity of their research than educational researchers, i.e., level of conceptual, or theory, development, statement of problems and hypotheses in more precise form than ordinary language permits, the appropriateness and efficiency of a variety of modern tools and techniques for the task at hand, etc. Writings of psychologists and sociologists typically exhibit greater familiarity with relevant developments in mathematics, recent scientific techniques and tools, and the current state of knowledge in cognate fields. Although educational research may remain in the realm of applied research, that is primarily concerned with supplying the data needed for making decisions relative to practical matters involved in the operation of schools, it still would be valuable to discover the nature and extent to which the applied research is being illumined by research methods already being used advantageously in related fields--integrated data processing, systems analysis, operations research methods, especially linear and dynamic programming, models (assignment, allocation, queing, sequencing), theory of games, and decision theory.

Similarly in relation to basic research, it would be helpful for future planning to describe the level of theory development, the extent and use of tools and techniques from modern mathematics and technology for conceptualization and analysis of problems.

The Role of Research in Education. Studies of the role of research in education were concerned with discussions of professional status and professional responsibility: Brown (1960); Harris (1960); Flagle, Huggins, and Roy (1960); Goode (1958); Hunt (1956); Kidd (1959); and the first Phi Delta Kappa symposium (Banghart, 1960).

It was said that research provides the foundation of professional status. Brown (1960) summarized the requirement of a profession for practitioners: (a) who are free and responsible individuals and who can be depended on because of their professional integrity to establish and maintain their professional standards of performance; (b) who keep a learning approach throughout life as a means of fulfilling their professional responsibilities through ready application of new knowledge.

Harris (1960) urged a "coming of age" in education. Technological schools, he contended, by abandoning the trades-training approach and instituting abstract theoretical approaches, now design engineering curriculums to make extensive use of intellectual formulations and research. According to Harris, technology, by coping intellectually with the problems it faced, won increasing respect and stature, but education appears to be still largely an application of psychological rules of thumb. Harris asserted that, to "grow up," education must conceptualize its processes and develop a series of new intellectual formulations. Improved conceptualization was also urged by the American Council on Education (ACE) (1939); the American Educational Research Association (AERA) (1956); Brim (1958); Brown (1960); Coladarci (1960); Goethals (1958); McConnell, Scates, and Freeman (1942); Travers (1958); Traxler (1954); and Ulich (1937).

Flagle, Huggins, and Roy (1960) maintained that the professions have been forced to give research a larger role by the rapidly changing character of the world. For example, coal can be mined, iron can be smelted and refined, easily located petroleum can be exploited without scientific aid; but it is estimated that within a generation 75 per cent of electrical energy must come from nuclear or solar sources. With unprecendented population increase, underdeveloped nations demand their full share of the world's goods. Inevitably all phases of civilization must become more complex and technical and demand greater scientific sophistication. Technology has become intellectual and strongly oriented toward research because the demands of the world have forced it to.

Not only have science and technology become more complex, but the rate at which changes occur has led to further problems. Johnson (1960) estimated that knowledge of the physical sciences doubles every

15 years, and of the social and management sciences every 50 years. The latter increases at about the same rate as the population of the world. General Electric has indicated that over 40 per cent of the products it currently sells were not in existence 10 years ago (Suits, 1958).

Brim (1958), Becker (1960), Hunt (1956), Kidd (1959), Traxler (1954) saw educational research as not keeping pace with the world. Becker (1960), finding an investment in American education of 24 billion dollars during 1960, observed serious deficiencies at all levels, and he believed that educational resources must be used more efficiently. His opinions were shared by Keezer (1960) and by the National Bureau of Economic Research report on the economics of education. Economics of research and education was also explored by Keezer (1960), Schultz (1959), Shockley (1957), and Siegel (1960). The point emphasized was that continuing expenditure on education presupposes a continual flow of good ideas. Simons (1960) saw the lack of such ideas as crucial and indicative of a necessity for greater emphasis on basic research.

The opinion that educational research has not kept pace with the world was widely expressed. Brim (1958) reported on deficiencies in educational research and proposed work to be performed by social scientists. Several professional organizations have expressed their concern in various ways. The Organization for Research in Education was established by the National Academy of Sciences and the National Research Council. (It was dissolved when the Council for Research in Education was established.) According to the first Phi Delta Kappa symposium (Banghart, 1960), more educational researchers are employed by foundations, industrial organizations, and agencies of the federal government than by public schools and universities.

Some notable activities were directed toward increasing educational research: the Council on Educational Research was established through the efforts of the late Percival M. Symonds and his associates at AERA. The Phi Delta Kappa Annual Symposium on Educational Research and the Big Ten Research Directors Conferences were institutied. The Center for Advanced Study in the Behavioral Sciences has begun to consider educational researchers.

The most important boost for educational research was the establishment of the Cooperative Research Program of the U.S. Office of Education and the various titles within the National Defense Educationa Act. When the history of educational research is reviewed with the perspective of the future, these federal programs will probably stand out as the significant turning point in educational research.

Unfortunately these efforts are still too little and too late. A recent survey reported at the first Phi Delta Kappa symposium (Fattu, 1960) indicated that, of the 94 colleges and universities which grant the doctorate in education, only 10 could be said to be making a serious effort to encourage educational research by maintaining a favorable intellectual climate and giving adequate financial support, by making time and facilities available for faculty research, or by giving significant consideration to research when appointing new faculty members. It was suggested that the observed indifference to research might be related in part to the domination of these institutions by practitioners who attained their positions of influence through literary and forensic skills rather than through contributions to and understanding of science. In terms of allocation of resources-finances and faculty time -all of the 10 most highly respected institutions devoted more to research than to field services; among the rest the emphasis was reversed. Similar findings were reported by Phillips (1957) and Ryans (1957).

To summarize, more research is needed if education is to carry out its responsibilities in a rapidly changing world. More funds and other support are necessary to educational research.

Although American public education is more efficient than at any earlier time (it is probably the most efficient in the world), it is not as effective as it can and must be to maintain the American way of life. There are many competent, dedicated educational researchers, but their number does not meet the demand. Current trends in industry and government suggest that other agencies are prepared to assume responsibility for adding new knowledge. The implications of such an outcome for education as a profession should be a matter of concern to all educators.

The Nature of Educational Research: Educational research seemed to have fluid boundaries encompassing virtually all phases of scholarly activity associated with the educative process and organization. It included carefully designed experimental studies of current and proposed practices; mass collections of data, such as surveys, not illumined by systematic conceptual guiding lines, thought of as routine work; theoretical, historical, philosophical, and integrative scholarly activities; critical reviews of research literature and summaries of issues and problems; applied research focused on local practices and policies, planned to stimulate interest in more fundamental studies, as well as to develop the school staff or solve an immediate problem.

The first Phi Delta Kappa symposium (Banghart, 1960) defined educational research variously as ranging from routine clerical operations to sophisticated disciplined inquiry. Descriptions of educational research included a variety of activities: listings and tabulation by titles (Blackwell, 1958; Brehaut, 1958); surveys of activities of researchers or organizations (Phillips, 1957; Ryans, 1957; H. K. Miller, MacArthur, 1958; Weitz, 1957); discussions of the nature of educational research (American Council on Education, 1939; AERA 1956; Coladarci, 1960; McConnell, Scates, and Freeman 1942; Levin, 1956; Travers, 1958; Traxler, 1954; Ulich, 1937; Walker, 1956); discussions of a framework for educational research (Goethals, 1958; Tiedeman and Cogan, 1958); discussions of activities of scientists (Schwab, 1960; Simons, 1960; Helmer and Rescher, 1959).

A consideration related to the definition of educational research is implied by the question--Is there a legitimate area for educational research? Discussion of the question appeared in several forms, but may be summarized as follows: Education is a practice and an art. The basic findings come from psychology, sociology, and other social sciences. Education takes these findings and applies them.

It is difficult to reconcile such a position with that observed among groups which currently make the most use of research--government, industry, and medicine. These fields recognize that discovery of new knowledge is only one step in the process toward effective utilization. For example, knowledge required to produce nuclear fission existed before the Manhattan project; it took a great deal of applied research and development to translate it into products and processes. In fact, the recent studies of the research and development process by the Carnegie Institute of Technology indicate that it is twice as costly (in time and resources) to produce the product or process as it was to make the original discovery.

A second relevant question is, What standards of research performance are self-imposed or enforced by the group? Again direct recent consideration is scaree. Lerner's (1959) and Weiss's (1960) comments more directly suggest that standards of expectation might be more explicitly defined and enforced. About a quarter of a century ago more direct attention seems to have been given to this matter (McConnell, Scates, and Freeman, 1942; ACE, 1939). In psychology the publications of Wolfle and Marquis are pertinent.

Desirable Amount of Research: No studies were discovered in the field of education that gave direct attention to the question of how much research is desirable. The National Science Foundation awarded grants to the Carnegie Institute of Technology and the Western Reserve University to study this problem in the physical sciences.

Discussions of this topic found in business publications were relatively frequent, probably because survival in a rapidly changing competitive environment demands innovation. The rule of thumb was, Don't do any less than your nearest competitor.

Becker (1960) commented on the effects of underinvestment in education. Noting that public and private expenditures for education run to [illegible], many billions of dollars each year, he pointed out that all types of education offer a fertile ground for comparative productivity and input-output studies.

The Distribution of Research Activity: Research activities are classified by the National Science Foundation as "basic research," "applied research," and "development."

Basic research includes original investigation for the advancement of scientific knowledge. The primary aim of the investigator is achievement of fuller knowledge or understanding of the subject matter under study, rather than making practical applications of new knowledge. Applied research is directed toward practical applications of scientific knowledge. Development is the systematic use of scientific knowledge for the production of useful materials, devices, systems, methods, or processes, exclusive of design and production engineering (Fattu, 1960). It is evident that the sequence from research to action is in that order. An invention of a device, procedure, or method cannot be made until the key, or last essential, fact is discovered: for example, a television set could not be produced until all the basic discoveries of electromagnetic radiation and synchronization of transmitted impulses had been made.

Tyler, in the Phi Delta Kappa symposium (Banghart, 1960), illustrated the utility of basic research using research in connection with hybrid corn as an example. Applied research on corn and cultivation practices had brought relatively small increments in yield; the development of hybrid corn, however, produced greatly increased yield. Here the breakthrough resulted from knowledge of plant genetics rather than from cultivation practices. The original discovery was made in 1908, but applications were not made until the 1930's when economic pressures forced the development. Also, hybrids must be developed or adapted to fit conditions of a region. Griliches (1957) summarized the story in detail and cited many related references. The example should be instructive to one who wishes to trace the interaction of basic research, applied research, and development.

Colleges and universities claim to add to as well as to disseminate knowledge; hence it would seem that basic research should find a congenial atmosphere within the university. The National Science Foundation reported that, in engineering schools, 57 per cent of total expenditures budgeted for research and development was devoted to basic research. In industry, funds for basic research totaled 344 million dollars, or about 4 per cent of the 9.4 billion dollars spent for research and development. Corresponding data for educational research are not available and would be meaningless at the present time. Certainly, educational research requires more applied research and development than basic research, but the funds available for all educational research are so much less than those available in other areas that the task would seem to be first raising the amount, before considering the distribution.

Selection and Preparation of Educational Research Workers

Comments on training for research were presented by the American Psychological Association (APA) (1959), Brim (1958), Brown (1960), Cronbach (1957), Goode (1958), Harris (1960), Keezer (1960), Kidd (1959), Travers (1958), and Walker (1957).

Selection of research workers was differentiated from that of practitioners. According to Cronbach (1957), Taylor (1956, 1958, 1959), and Thistlethwaite (1959), selection of researchers should emphasize creativity, as well as measures of aptitude, school performance, and motivation toward original inquiry.

It was suggested that a high grade in undergraduate work might be evidence of conformity that might be undesirable in research. Undergraduate performance in tasks requiring creativity, originality, and intellectual nonconformity were thought of as probably being better predictors. Motivation toward research was also considered a prime criterion for selection. Perseverance seemed a significant factor in scientific achievement. (In his autobiography, Max Planck stated that for 19 years the exploration of the Second Law of Thermodynamics occupied every waking moment that he could recall. Kepler and Galileo worked more than 30 years before they produced their formulations. Breakthroughs in science apparently require a high order of creativity and a concentrated effort sustained over a period of many years.) It seems reasonable to believe that the more complex the area of investigation, the more sustained effort is required.

There was agreement that the training of researchers should also differ from that of practitioners. It was suggested by several authors, including Helmer and Rescher (1959), that researchers need to understand the strategy and tactics of science and the language of science (including modern mathematics) and an academic scientific area. The preparation of research workers in the physical sciences appears to be more demanding than that for social scientists.

Agreement was almost unanimous that the best preparation for research is apprenticeship to a skilled researcher. The opportunity to participate in and carry on independent research and publication was regarded as indispensable. The APA report (1959) summarized this point of view as follows: "Everything we have found points to the fact that course work, formal examination requirements, and anything else that could be standardized concerns what is ancillary to research training. What is of the essence is getting the student into a research environment and having him do research with the criticism, advice, and encouragement of others who suffer the same rewards. . . . . Research is learned by doing and taught mainly by contagion. Research must first be going on if there is to be research training. What formal courses are offered is no index of quality of a department as regards such training; the only adequate index is the eventual productivity of the individuals that the department produces."

The topic discussed here has been some issues relative to educational research. No definitive answers were found, and at this time it would be premature to offer any. However, the well-being of education as a profession may lie in serious consideration of these and related topics.

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CHAPTER II

FACULTY AND ADMINISTRATOR QUESTIONNAIRE STUDY

Copies of the faculty and administrator questionnaire are presented in Appendix C. The procedure in developing the items was to use the input-process-output outline and the outline of the "Items to be covered by questionnaire and interview schedules" of Appendix B as a blueprint. Three variations of a pilot form were prepared and tried out with 50 faculty members at two adjoining schools not included in the study. After analysis of tryout and revision of the form, the faculty questionnaire was prepared.

Sample: Catalogs of the schools offering doctoral level graduate work in education (see Appendix A for list of schools) were examined, and the names of faculty members who appeared to be involved in teaching courses dealing substantively with research--measurement, statistics, methodology, seminars, colloquia, individual problems research, etc.--were selected. A list of more than 1100 names was compiled in this way. A questionnaire and self-addressed stamped return envelope was sent to each person. About 573 returns (52 per cent) were received. A random sample, using the Fisher and Yates tables of random numbers, was taken for detailed analysis.

Analysis: Frequency distributions of responses, comparison of administrator and faculty responses, and bivariate distributions comparing responses to each item with response to all other items were made. Chi-square tests of significance were computed. The data, sample and questionnaire were such that scaling was not deemed feasible or desirable.

In order to determine possible bias in responses, frequency distribution were prepared of the first 100 and the last 100 questionnaires received. No tests of significance were made because variation appeared to be well within the tolerance limits of random sampling.

Results:

Results are presented under three headings:

A. Frequency Distributions
B. Comparison of Administrator and Faculty Responses
C. Bivariate Distributions

A. Frequency Distributions of Responses.

Table 1 indicates the "present" positions of the respondents. More than one-third of the group were professors; about 45 per cent were assistant or associate professors; and about 14 per cent were administrators. Instructors seemed to be a scarce commodity.

Table 1: Present Position or Title

	Number	Per cent
Professor	70	36.7
Associate Professor	43	22.6
Assistant Professor	45	23.7
Instructor	2	1.0
Head of Department	11	5.8
Director	11	5.8
Dean	4	2.1
Other	4	2.1
Total	190	100.0

Table 2 permits comparison of actual and preferred distribution of time among various activities: A. Teaching, counseling, advising and related student-contact activities; B. Administrative and field service activities; C. Research and scholarly inquiry activities; D. Other activities.

Table 2: Actual and Preferred Distribution of Time Among Various Faculty Activities

	Per cent of time									
	1-20		21-40		41-60		61-80		81-100	
	No.	%	No.	%	No.	%	No.	%	No.	%
A. Teaching, counseling, advising, and related student-contact activities										
Actual	19	10.0	35	18.4	67	35.3	40	21.0	29	15.3
Preferred	27	14.2	55	29.0	75	39.5	25	13.2	8	4.2
B. Administrative and field service activities										
Actual	109	57.4	45	23.7	23	12.1	11	5.8	2	1.0
Preferred	125	65.8	39	20.5	18	9.5	7	3.7	1	0.5
C. Research and scholarly inquiry										
Actual	131	69.0	38	20.0	19	10.0	2	1.0	0	0.0
Preferred	70	36.8	75	39.5	38	20.0	5	2.6	2	1.0
D. Other activities										
Actual	186	97.9	4	2.1	0	0.0	0	0.0	0	0.0
Preferred	184	96.8	6	3.2	0	0.0	0	0.0	0	0.0

Respondents say they would prefer to spend less time than they actually do on teaching, counseling, and other student contact activities, and also slightly less time than they do on service and administrative activities. They would like to spend more time than they actually do on research and scholarly activities.

Results of table 2 are more clearly delineated in charts 1 to 4. Chart I compares the cumulative frequencies of actual and preferred distributions of student contact activities. The median for preferred is at the 35th percentile rank, that for the actual is at the 42nd. This difference is not large enough to be significant.

Chart I. Cumulative Frequency Comparison of Actual and Preferred Distribution of Time to Student Contact Activities

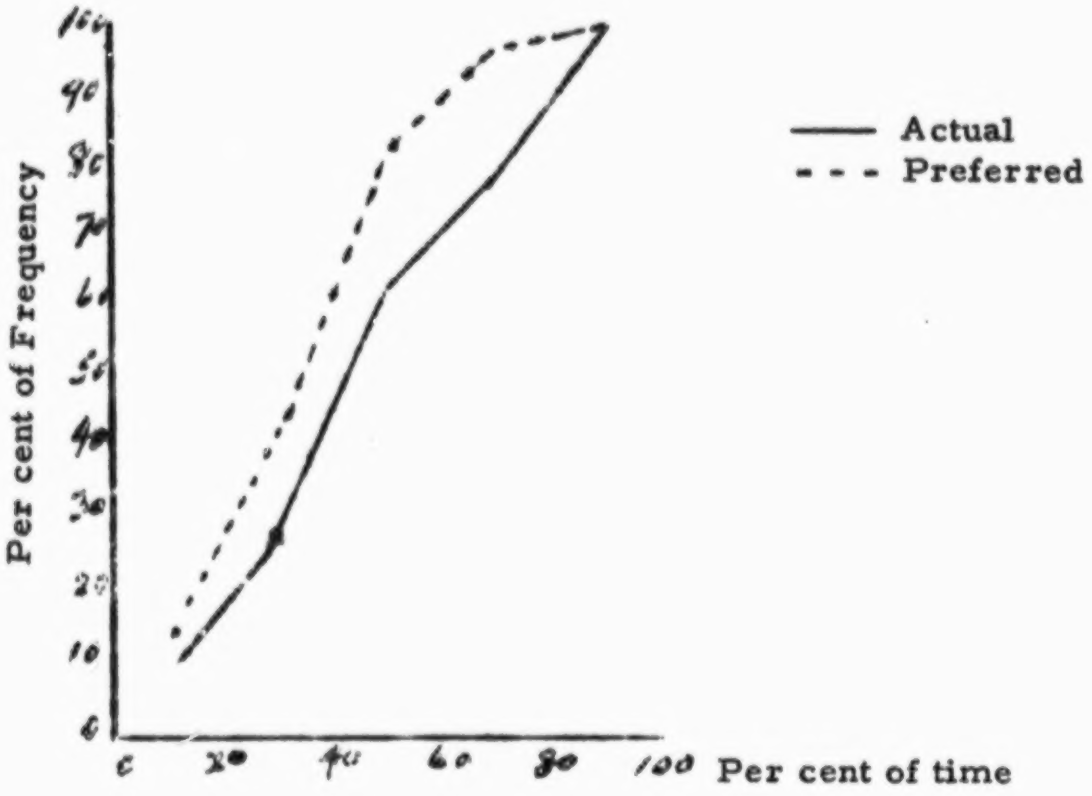

Chart II. Cumulative Frequency Comparison of Actual and Preferred Distribution of Time to Administrative and Field Service Activities

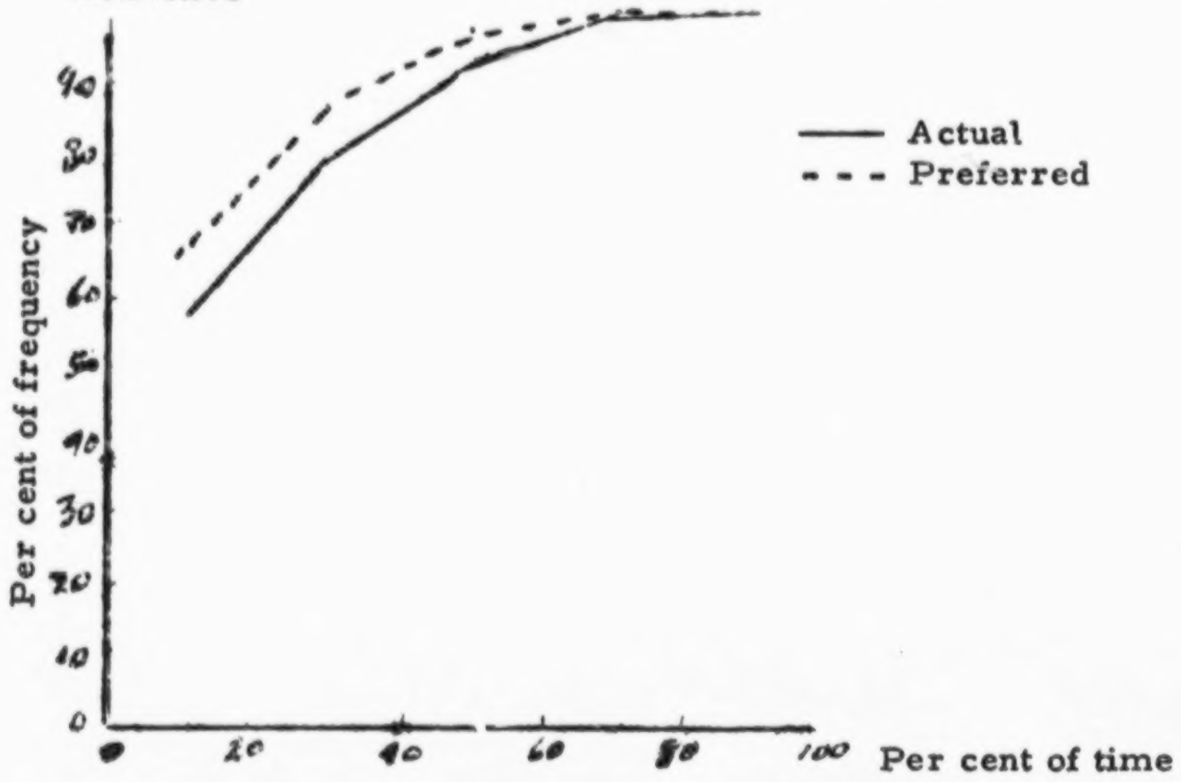

Chart III. Cumulative Frequency Comparison of Actual and Preferred Distribution of Time to Research and Scholarly Inquiry

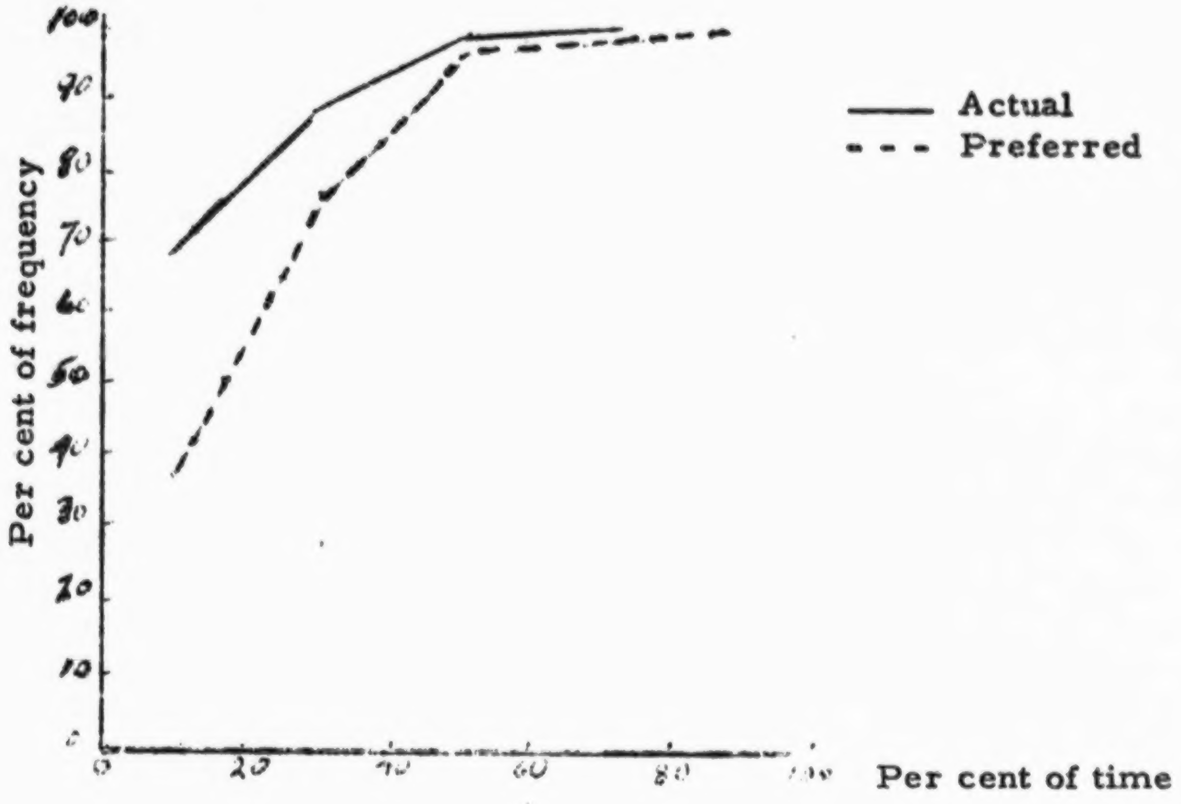

Chart IV. Cumulative Frequency Comparison of Actual and Preferred Distribution of Time to Other Activities

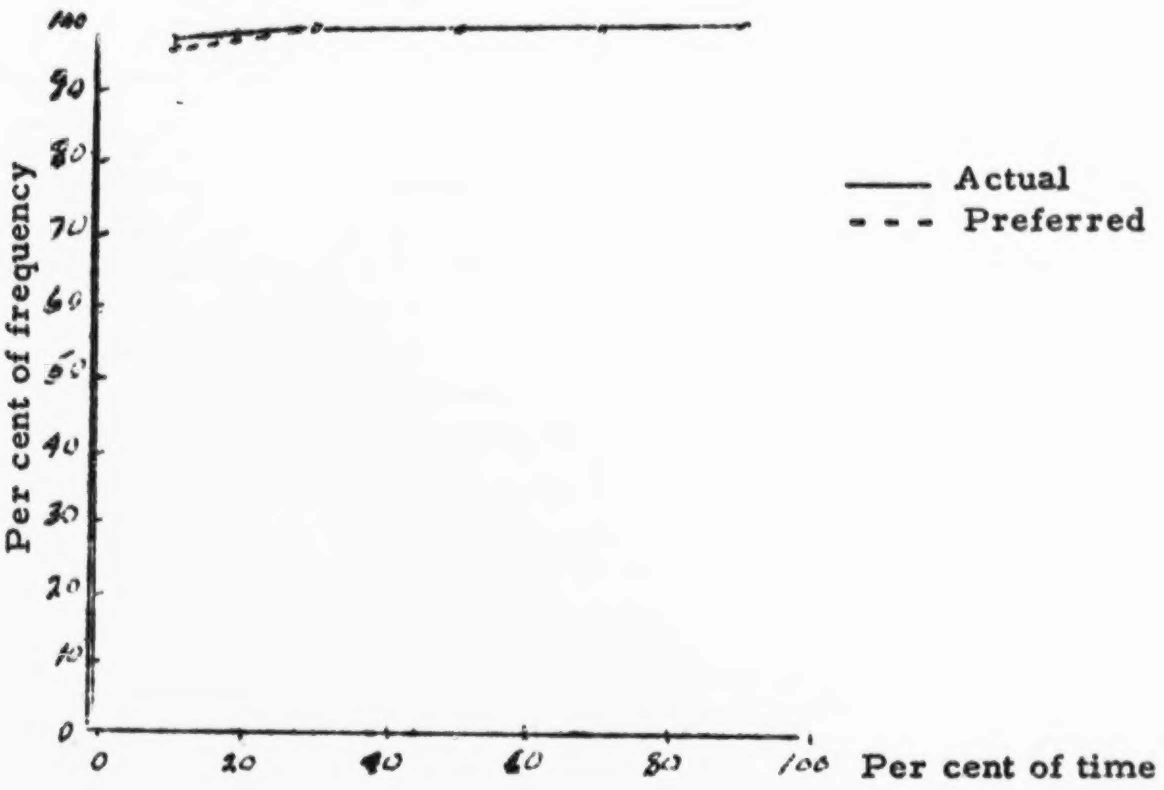

Chart II compares the cumulative frequencies of actual and preferred distribution of time devoted to administration and field service activities. These distribution indicate that the majority of respondents spend relatively little time on these activities, and they would prefer to spend even less. Again the difference between preferred and actual time distribution is not significant.

Chart III compares the cumulative frequencies of actual and preferred distribution of time devoted to research and scholarly inquiry. Ninety per cent of the group actually spend less than one-fourth of their time on this activity. In terms of preference ninety per cent would like to up to fifty per cent of their time in research and inquiry activities. This difference is significant at the .10 level of significance.

Table 3 indicates that two-thirds of the respondents say that they are doing research at the present time. In view of what is achieved in terms of publications this figure appears to be somewhat optimistic.

Table 3. Responses to Question 'Are You Doing Research At The Present Time?'

	Number	Per cent
No	61	32.3
Yes	128	67.7
Blank	1	0.0

Table 4 on self-perception relative to research indicates that about one-sixth see themselves primarily as 'producers;' about three-sevenths of the group see themselves as primarily consumers or interpreters of research, and about two-fifths see themselves as about equally consumers and producers of research. Apparently much of the activity reported as research in table 3 consists of reading results of research and interpreting it, presumably to students.

Table 4. Self-Perception Relative To Research

	Number	Per cent
Primarily a consumer, or interpreter	82	43.2
Primarily a producer	33	17.4
About equally a consumer and producer	77	40.5

Table 5 indicates that it is very important for respondents to be doing research. About 93 per cent answered affirmatively.

Table 5. Is It Important For You To Do Research?

	Number	Per cent
Yes	170	92.9
No	13	7.1

Table 6 response is not quite as emphatic as table 5. Only 80 per cent of respondents believe that research is essential in their field. One wonders about the perception of the other 13 per cent (e.g., 80 per cent of table 6 vs. 93 per cent of table 5.)

Table 6. How Important Is Research In Your Field?

	Number	Per cent
A luxury	8	4.2
Useful	20	15.8
Essential	155	80.0

Table 7 indicates that almost 84 per cent of respondents feel that the attitude of their school is favorable toward research. About 11 per cent indicate indifference. In view of responses to subsequent questions this response appears to be more optimistic than one would estimate.

Table 7. Attitude of Your School Toward Research

	Number	Per cent
Unfavorable	10	5.3
Indifferent	21	11.2
Favorable	157	83.5

Table 8 indicates that about 42 per cent of the group feel that research is underemphasized at their school. Only 13 per cent feel that it is overemphasized. It is difficult to interpret this figure, but age and attitudes of open-mindedness might be interesting correlates. Unfortunately these relationships could not be traced in the data collected. There is a suggestion of stereotypy in the responses to several of these items.

Table 8. Extent Of Emphasis On Faculty Research Activity

	Number	Per cent
Underemphasized	79	41.8
Appropriately emphasized	85	45.0
Overemphasized	25	13.2

Table 9 responses suggest that most research is done by faculty members and in graduate student theses. Only 10 per cent is said to be done by a Bureau or Institute. Again stereotypy of response is evident. Actual examination of publications suggests a different figure. Outside of a few schools the major portion of research consists of graduate student theses. Also the per cent of publications produced by Bureaus and Institutes is grossly under-rated in these responses. In all of these tables it should be remembered that responses are impressions or attitudes of respondents. These may or may not jibe with reality.

Table 9. Most Of The Educational Research At This School Is Done By:

	Number*	Per cent
Individual faculty members	110	49.5
A Bureau or Institute	23	9.9
Graduate student (theses)	99	42.6
Total	232	100.0

*Some respondents checked two items!

Table 10 indicates respondent impressions of rank order of most common types of publications by faculty. Surveys appear to be the most popular. Experimental studies and discussions of importance of teaching appear to be next on the scale of popularity. Perhaps the most significant column in this table is the "Blank" column. In part this is due to the fact that rank orders were to be assigned to only five of the thirteen possible categories. If ranks were assigned completely at random one would expect eight thirteenths of responses to be in the blank column or a frequency of 117. Activities least frequently ranked, or ranked at all, include "textbook and other activity," "philosophical research," "book reviews," "historical research." Activities most frequently ranked include "surveys," "discussions of significance of teaching," "experimental studies."

This item was designed to obtain a faculty impression of frequency of various types of publications of faculty. Stereotypy of response, in that impressions and facts don't necessarily jibe are quite evident. The important fact for this study is that faculty impressions are not congruent with the facts of actual publications, except in the extreme case. Surveys do in fact appear to be the most frequent type of publication, but experimental studies appear to be grossly over rated. Questions as to what constitutes an experimental study in the minds of respondents might well be raised at this point. The same query might be raised with other subitems of this group. It is, however, evident that impression and reality are not the same in this case.

Table 10. Rank Order Of Most Common Types of Publications of Faculty

		RANK					
		1	2	3	4	5	Blank
Surveys	N	53	28	13	19	12	65
	%	27.9	14.7	6.8	10.0	6.3	34.2
Testing Problems	N	5	9	13	16	6	141
	%	2.6	4.7	6.8	8.4	3.2	74.2
Correlational Studies	N	8	20	20	15	10	117
	%	4.2	10.5	10.5	7.9	5.3	61.6
Experimental Studies	N	25	23	16	12	19	95
	%	13.2	12.1	8.4	6.3	10.0	50.0
Discussions of School Practices	N	8	25	15	13	12	117
	%	4.2	13.2	7.9	6.8	6.3	61.6
Discussions of Significance of Teaching	N	27	17	19	14	20	92
	%	14.1	9.0	10.0	7.4	11.0	48.4
Inspirational Professional Writing	N	13	8	14	11	17	127
	%	6.8	4.2	7.4	5.8	9.0	66.8
Editorials	N	8	4	11	7	14	146
	%	4.2	2.1	5.8	3.7	7.4	76.8
News Notes and Reports	N	3	3	9	13	10	152
	%	1.6	1.6	4.7	6.8	5.3	80.0
Book Reviews	N	1	8	6	8	8	159
	%	0.5	4.2	3.2	4.2	4.2	83.6
Historical Research	N	3	7	9	7	8	156
	%	1.6	3.7	4.8	3.7	4.2	82.1
Philosophical Research	N	2	2	3	9	5	169
	%	1.0	1.0	1.6	4.7	2.6	89.0
Textbook and Others	N	3	1	2	1	0	183
	%	1.6	0.5	1.0	0.5	0.0	96.3

Table 11 suggests that among those doing research (those 16% who responded positively to the item) about one-half indicate that their work was not supported. About 20 per cent reported they were supported by a grant from the institution. The interview study revealed that institutional support was quite modest; $200 was regarded as a substantial amount! Only thirty per cent of those responding, or 26.3% of all respondents said they received a grant from an outside agency. Evidence in the interview study suggests that this figure may be optimistic. At any rate it would form a convenient means for subsequent comparison with the frequency receiving outside support in 1966.

Table 11. If You Are Doing Research At The Present Time, How Is It Supported?

		Blank	Checked
Not supported; must be done on own time and resources	N	107	83
	%	56.3	43.7
By a grant from the institution	N	156	34
	%	82.1	17.9
By a grant from an outside agency	N	140	50
	%	73.7	26.3

Table 12 presents responses relative to significance of various factors relative to research productivity. In terms of rank order within the table as a whole, factors appear in the following order: "library or bibliographic resources," "reduced teaching load;" "secretarial and typing assistance;" "administrative assistance in search for funds;" "associates who actively work on their own research projects;" "administrative recognition for research through promotion, salary, etc.;" "clerical and statistical assistance." Designated as being of lesser importance were "associates whose interest in research are similar to your own," "meetings of faculty for research discussions," "bringing research lecturers to the campus." These all suggest that research productivity is regarded as an individual rather than a group or social enterprise. This sequence of responses are congruent with those of the interview study. Producers of research are intellectually autonomous and fiercely independent in their thinking and working. Recent tendencies toward socialization of research activities appear to run counter to this feeling, and may perhaps be less efficient than the structure they presume to displace.

Table 12. How Important Do You Consider These Factors For Research Productivity?

		Not Important	Important	Very Important
A. Associates				
Who publicly endorse and support research	N	26	78	86
	%	13.7	41.0	45.3
Who actively work on their own research projects	N	11	64	115
	%	5.8	33.7	60.5
Whose research interests are similar to own	N	68	83	39
	%	35.8	43.7	20.5
B. Time				
Reduced teaching load	N	14	45	131
	%	7.4	23.7	69.0
Sabbatical leave	N	36	79	75
	%	19.0	41.6	39.5
Meetings of faculty for research discussions	N	54	92	44
	%	28.4	48.4	23.2
C. Encouragement				
Adm. recognition for research thru promotion, salary, etc.	N	19	57	114
	%	10.0	30.0	60.0
Administrative assistance in search for funds	N	16	56	118
	%	8.4	29.5	62.1
D. Organization				
A formal organization to aid faculty research	N	37	79	74
	%	19.5	41.6	39.0
E. Facilities				
Space for research needs	N	12	83	95
	%	6.3	43.7	50.0
Equipment for research	N	15	67	108
	%	7.9	35.3	56.8
Library or bibliograph resources	N	11	41	138
	%	5.8	21.6	72.6
Financial Support for:				
Purchase of equipment	N	22	84	84
	%	11.6	44.2	44.2
Travel to research centers & meetings	N	22	69	99
	%	11.6	36.3	52.1

Table 12 (Continued)

		Not Important	Important	Very Important
Publication costs	N	28	86	76
	%	14.7	45.3	40.0
Bringing research lecturers to campus	N	49	93	48
	%	25.8	49.0	25.3
Computing costs	N	31	89	70
	%	16.3	46.8	36.8
F. Assistance				
Consulting help in formulating problem, design analysis, etc.	N	25	80	85
	%	13.2	42.1	44.7
Cler'l & statis't assist.	N	12	64	114
	%	6.3	33.7	60.0
Help in preparing proposals for outside support	N	20	105	65
	%	10.5	55.3	34.2
Secretarial & typing assistance	N	7	62	121
	%	3.7	32.6	63.7
Help in designing, obtaining, using measuring devices	N	15	89	86
	%	7.9	46.8	45.3
Computing facilities	N	22	66	102
	%	11.6	34.7	53.7
G. Graduate students				
Capable graduate assistants	N	5	72	113
	%	2.6	37.9	59.5
Students interested in research as career	N	17	100	73
	%	9.0	52.6	38.4

Table 13 is concerned with responses relative to the direct support the school provides for research. About 60 per cent said their schools had "associates who are actively working on research projects," "whose interests are similar to your own," and "who publicly endorse research and scholarly work." It is interesting to observe that about one-fourth of the group left their responses blank. These who abstained from responding may be regarded as essentially behaving, or at least, not sure that their institutions actually provided such support.

The previous table indicated that reduced teaching load was regarded as of considerable importance to research productivity. Responses to the support given by actually reducing teaching load indicated that 36 per cent said teaching load was reduced to aid research. Responses to the next item on the amount of such reduction indicate that three-fourths said the amount of reduction was zero per cent. There is a disparity of 11 per cent (36-25=11) between this response and the corresponding one of table 12. Of those who presumably received some reduction in teaching load, the amount was 10 per cent or less, 8.4 per cent, 30 per cent reduction or less 42 per cent; and 60 per cent reduction or less 85%. About 15 per cent received more than 60 per cent reduction in teaching load for doing research

With reference to sabbatical leave available for research and advanced study, it is surprising that only 50 per cent answer yes--especially when one bears in mind that all of these institutions grant the doctorate in education. Among those where sabbaticals are given the period of 6-7 years appears to be model.

About one-third stated that symposia were held, but 80 per cent responded negatively when queried about the frequency of meetings. About one-third who indicated that meetings of faculty were held for discussions related to research, but 81 per cent responded none or blank when asked about the frequency of such meetings.

In response to the item "Research is an important consideration in salary increments and promotions;" 16 per cent responded ' no," and 22 per cent left it blank; of the remaining 62%, 41 per cent responded ' yes," it was properly emphasized; 10.5 per cent said it was underemphasized and 10.5 per cent that it was overemphasized.

As to organization, about one-third indicated that there was a formal organization available to aid research in education on their campus. Almost two-thirds reported either ' No" or left the item blank.

With respect to facilities, only 24 per cent indicated that sufficient space was provided for faculty research, and 35 per cent indicated that equipment was provided for faculty research. In terms of library and bibliographic facilities the picture was much brighter, about 81 per cent agreed they were satisfactory or excellent. Apparently these schools, that granted the education doctorate encouraged library study, but only about one-third did anything in particular about space and equipment for faculty research.

Financial support was explored in terms of "purchase of equipment for faculty research," "support for travel to other research centers and meetings," ' support for publications costs," "support for bringing lecturers to campus," "support for computing costs.' Relative to purchase of equipment for faculty research about 44 per cent indicated "no" or blank. About one-fourth felt that is was "satisfactory." In terms of support of travel to other research centers and to meetings about one-fourth felt it was satisfactory or better. Support for publication costs was described as nonexistent, or left blank, by about 50 per cent of the group. Less than one-fifth of the group described the support as sufficient or better. Support for bringing research lecturers to the campus was said to be nonexistent or left blank by about 50 per cent of the group. About one fourth of the group found it satisfactory or better. Support for computing costs was described as satisfactory or better by almost 40 per cent of the group; about 40 per cent responded "no" or blank, and 21 per cent said some help was given but it was insufficient. In terms of financial support for research about one-fourth of the group, with fairly good consistency among items, felt it was satisfactory. Apparently the majority felt it could be improved.

Table 13. "What Direct Support Does Your Institution Provide For Research?"

		No	Yes	Blank
A. Associates in your division:				
Who publicly endorse research and scholarly work	N	28	112	50
	%	14.7	59.0	26.3
Who are actively working on research projects	N	212	122	47
	%	11.0	64.2	24.7
Whose interests are similar to your own	N	32	113	45
	%	16.8	59.5	23.7
B. Time				
Teaching load is reduced to aid research	N	88	68	33
	%	46.6	36.0	17.4
Amount of reduction		Per cent	Number	Per cent
		0	141	74.6
		1 - 10	4	2.1
		11 - 30	16	8.4
		31 - 60	21	11.1
		61 - 90	7	3.7
		91 - 100	0	0.0

Table 13. (Continued)

		No	Yes	Don't know		
Sabbatical leave is available for research & advanced study	N	68	96	26		
	%	35.8	50.5	13.7		
How often are sabbatical leaves given?		Blank	0-5	6-7	8 or more yrs.	
	N	113	8	69	1	
	%	59.5	4.7	36.3	0.5	
Symposia on research are held	N	111	60	19		
	%	58.4	31.6	10.0		
Number of weeks between symposia		None or Don't know	1-5	6-10	over 10	
	N	151	17	8	8	
	%	79.5	9.0	3.2	3.2	
Meetings of faculty for discussions related to research	N	114	65	11		
	%	60.0	34.2	5.8		
How often?		0 or don't know	1-5	6-10	11-15	16 or over
	N	154	14	6	2	13
	%	81.0	7.4	3.2	1.0	7.4

C. Encouragement

Research is an important consideration in salary increments and promotion.	Number	Per cent
No	31	16.3
Yes, underemphasized	20	10.5
Yes, properly emphasized	78	41.0
Yes, overemphasized	20	10.5
Blank	41	21.6

D. Organization

		No	Yes	Don't know
There is a formal organization to aid research in education	N	99	64	27
	%	52.1	33.7	14.2

Table 13 (Continued)

	Number	Per cent
E. Facilities		
Space is provided for faculty research		
No	69	36.3
Yes, inadequate	64	33.7
Yes, sufficient	44	23.6
Yes, generous	1	0.5
Blank	12	6.3
Equipment is provided for faculty research		
No	34	20.1
Yes, insufficient	76	45.0
Yes, adequate	55	32.5
Yes, generous	4	2.4
Blank	21	11.0
Bibliographic and library facilities		
No	10	5.5
Yes, unsatisfactory	25	13.7
Yes, satisfactory	91	49.7
Yes, excellent	57	31.1
Blank	7	3.5
Financial support is provided for purchase of equipment for faculty research		
No	50	26.3
Yes, insufficient	55	28.9
Yes, satisfactory	50	26.3
Yes, generous	2	1.3
Blank	33	17.4
support for travel to other research centers and meetings		
No	41	21.6
Yes, insufficient	77	40.5
Yes, satisfactory	42	22.1
Yes, generous	9	4.7
Blank	21	11.0

Table 13 (Continued)

	Number	Per cent
support for publication costs		
No	60	31.6
Yes, insufficient	60	31.6
Yes, satisfactory	32	16.8
Yes, generous	3	1.6
Blank	35	18.5
support for bringing research lecturers to campus		
No	57	30.0
Yes, insufficient	47	24.7
Yes, satisfactory	46	24.2
Yes, generous	5	2.6
Blank	35	18.4
support for computing costs		
No	44	23.2
Yes, insufficient	40	21.0
Yes, satisfactory	52	27.4
Yes, generous	20	10.5
Blank	34	17.9

Table 14 is concerned with assistance to research in terms of consulting help in formulating problem, design analysis, etc.", "clerical and statistical assistance," "secretarial and typing assistance," "help in developing, selecting or using measurement and various data collection devices."

Relative to consulting help in formulating problem, design analyses and the like about 40 per cent felt it was satisfactory or generous, 43 per cent thought it was nonexistent or left the item blank, 16 per cent said some help was given but it was insufficient. As to clerical and statistical assistance about 40 per cent indicated that some help was given but it was insufficient, around 27 per cent thought it was satisfactory, and 33 per cent said no help was given or left the item blank. The story appears to be similar for the item secretarial and typing assistance. Around 26 per cent indicated no or blank, 45 per cent indicated some help was given but not enough, and about 29 per cent felt it was satisfactory. Help in making applications for research projects was marked "no" or blank by 37 per cent of the group. About 20 per cent noted that some help was given but it was insufficient. Approximately 43 per cent fround the help in making application for research projects was satisfactory or better. Help in instrument development was described as "no" or blank in more than 40 per cent of the cases. Another 24 per cent said "yes" but it was insufficient. Approximately 35 per cent felt it was satisfactory or generous.

Again it may be observed as in table 13 that about one-fourth of the group found the assistance given to research was satisfactory in terms of the items contained in table 14. Whether this is due to stereotypy or to firm belief could not be explored in terms of the data that were available.

Table 14. Assistance to Research

		No	Yes, insufficient	Yes, satisfactory	Yes, Generous	Blank
Consulting help in formulating problem, design analysis, etc.	N	52	31	64	13	30
	%	27.4	16.3	33.7	6.8	15.8
Clerical and statistical assistance	N	46	75	48	4	17
	%	24.2	39.5	25.3	2.1	9.0
Secretarial and typing assistance	N	36	85	52	3	14
	%	19.0	44.7	27.4	1.6	7.3
Help in making application for research projects	N	41	38	72	10	29
	%	21.6	20.0	37.9	5.3	15.2
Help in developing, selecting or using measuring and data-collecting devices	N	44	45	53	14	34
	%	23.2	23.7	27.9	7.3	17.8

Table 15 indicates the number of graduate assistants that the respondent claimed to have. About one-half indicated none; approximately 21 per cent indicated one, and around 13 per cent indicated two. Approximately two per cent of the group indicated they had 15 or more graduate assistants. Most likely these people did not comprehend the instructions. They probably indicated the number in their division rather than the number they had personally. .

Table 15. Graduate Assistants Frequency.

		Number	Per cent
Number of graduate assistants			
How many do you have?	0	93	49.5
	1	39	20.7
	2	24	12.8
	3	4	2.1
	4	9	4.8
	5	5	2.7
	6	2	1.0
	7	3	1.6
	8	2	1.0
	9	0	0.0
	10	2	1.0
	11	0	0.0
	12	1	0.5
	13	0	0.0
	14	0	0.0
	15	3	1.6
	16	1	0.5

Table 16 presents responses to graduate assistant duties. Almost 53 per cent of the respondents left this item blank. Another 32 per cent indicated that assistant's duties were something other than teaching and/or research. One wonders what sort of duties assistants were called upon to perform, or how the positions were justified within the university.

Table 16. Graduate Assistants Duties

	Number	Per cent
No response	100	52.6
Teaching assistant	15	7.9
Research assistant	11	5.8
Teaching and research	4	2.1
Other	60	31.6

Table 17 indicated the required number of hours of work per week that assistants were assigned--52 per cent of respondents indicated no response, about 6 per cent had less than 15 hours required, approximately 4 per cent had 21 hours or more. Most graduate assistants, about 39 per cent, had between 10 and 20 hours per week of required work.

Table 17. Graduate Assistants-Required Number of Hours of Work Per Week

	Number	Per cent
No response	98	51.6
1 - 4 hours	6	3.2
5 - 9 hours	5	2.6
10 - 15 hours	29	15.3
16 - 20 hours	45	23.8
21 hours or more	7	3.7

Table 18 indicates career objectives in graduate student preparation. Respondents were asked to designate the three that they regarded as most important for their graduate program. A rank of 1 was to be assigned to the most important objective. Only three were to be checked. Table 18 presents only the frequency of responses to this item. In each instance percentages are computed on the basis of the number of respondents 190; obviously they can not add up to 100 on this basis. In this table percentages were arranged on the basis of their magnitude. The three most important career objectives were said to be "to prepare university administrator," "to prepare professional research workers," and "to prepare public school administrators," "to prepare university professors," (!), and "to prepare educational specialists."

Table 18. Please Indicate The Three Most Important Objectives Of Doctoral Training In Your Division Of Education. (Assign 1 to the most important objective.)

	Number	Per cent
To prepare:		
university administrator	162	85.3
public school administrator	78	41.3
university professor	78	41.3
teachers for teacher's colleges	111	58.4
public school teachers	141	74.6
professional research workers	145	77.1
educational specialists	90	48.7

Table 19 presents responses to the question "On what basis does your graduate school select people for admission to the doctoral program in education?" Almost 56 per cent required teaching experience, 44 per cent required a transcript of undergraduate record. Some surprising entries are noted: 39 per cent required a Bachelor's degree vs. the 44 per cent requiring a transcript of undergraduate record. Also 78 per cent indicated "other admission requirements." Respondents could mark as many entries as were pertinent and more than one was usually marked. No attempt was made to tabulate the number of entries that were marked. Only the frequency of each designation was tabulated. Percentages were computed on the base of 190, hence their sum will not be equal to 100. Rank order of responses is probably the most significant datum, but this is the ambiguous "other admission requirements." Evidently this was not the proper form for this question.

Table 19. Basis on Which Graduate School Selects People For Admission To The Doctoral Program In Education

	Number	Per cent
Bachelor's degree	75	39.5
Master's degree	43	22.6
Examination	55	29.0
Transcript of undergraduate record	84	44.2
Teaching experience	106	55.8
Other admission requirements	149	78.4

Table 20 presents responses to the item: Would the typical doctoral graduate student in your area be required to conduct independent research in his future work? About 56 per cent indicated "yes." Remaining responses were about equally divided between "No," 22 per cent, and "Don't know," 23 per cent.

Table 20. Would The Typical Doctoral Graduate In Your Area Be Required To Conduct Independent Research In His Future Work?

	No	Yes	Don't know
Number	41	106	43
Per cent	21.6	55.8	22.6

Table 21 indicates response to the item: Do you believe that the typical doctoral graduate in your area is adequately prepared to do independent research? About 42 per cent said "no," and 22 per cent "undecided." Only 36 per cent answered "yes" that they believed the typical doctoral graduate was adequately prepared to do research independently.

Table 21. Do You Believe That The Typical Doctoral Graduate In Your Area Is Adequately Prepared To Do Independent Research?

	Number	Per cent
No	80	42.1
Yes	68	35.8
Undecided	42	22.1

Table 22 shows responses to the item: Is training for research an important part of the doctoral program in your education division? Approximately 69 per cent indicated "yes." This appears to be roughly twice as many as those who indicated they believed the typical graduate was adequately prepared to carry on independent research. One does not know if this is a reflection in the research training program, or if they believe that research is no longer an individual independent activity.

Table 22. Is Training For Research An Important Part Of The Doctoral Program In Your Education Division?

	Number	Per cent
No	37	19.5
Yes	132	69.5
Undecided	21	11.0

Table 23 attempts to explore "How much emphasis is given to research training?" Two categories of response stand out: 1) "All doctoral students are prepared to be intelligent consumers of research," 72% answered "yes"; 2) the other responses - "all doctoral students are prepared to be independent producers of research," "research training is only a peripheral activity," and "research is equal to preparation for teaching and administration," to which about two-thirds of respondents answered "no."

Table 23. How Much Emphasis Is Given To Research Training?

		No	Yes
Equal to preparation for teaching administration	N	127	63
	%	66.8	33.2
Only a peripheral activity	N	127	63
	%	66.8	33.2
All doctoral students are prepared to be intelligent consumers of research	N	54	136
	%	28.4	71.6
All doctoral students are prepared to be independent producers of research	N	120	70
	%	63.2	36.8

Table 24 responses should be compared to those given to table 23; they compare, "what is" with what respondents think "ought to be." Respondents in 85 per cent of the cases, indicate that research training ought to prepare students to be intelligent consumers of research; about 53 per cent said students ought to be prepared to be independent producers of research--the comparable per cent for what respondents thought was actually the case was 37 per cent. Only ten per cent said research ought to be only a peripheral activity versus 33 per cent who said it actually was a peripheral activity. Clearly respondents were in favor of more research training for graduate students.

Table 24. What Emphasis Do You Think Should Be Given To Research Training In A School of Education?

		No	Yes	Don't know
Equal to preparation for teaching administration	N	76	86	28
	%	40.0	45.3	14.7
Only a peripheral activity	N	158	19	13
	%	83.2	10.0	6.8
Prepared to be intelligent consumers of research	N	22	161	7
	%	11.6	84.7	3.7
Prepared to be independent producers of research	N	64	100	26
	%	33.7	52.6	13.7

Table 25 summarizes responses to twelve objectives in the research training program of typical doctoral students in the respondent's department. In their order of rank the four most frequently checked objectives were development of ability "to read and understand the general and some of the technical professional literature;" "to collect, tabulate, and analyze data on assigned problems;" "to define researchable problems within a problem area;" "to select and use appropriate statistical procedures." The four least frequently checked objectives were "to develop or derive new statistical procedures," to direct the research of other people," "to read and understand most of the technical professional literature," and "to design and carry out original studies that represent fundamental contributions to knowledge." As much as any single item, this one indicates the level of aspiration that faculty hold for their students. Apparently they have made their peace with the world and settled for carrying on a job without any great aspiration to make fundamental contributions to knowledge. Whether this decision results from resignation, or from what they consider to be a realistic appraisal of the situation, remains a moot question.

Table 26 presents responses to the item on rank order of the five most important personal characteristics significant in selection of people for concentrated research training. Two sorts of responses are significant in selection of people for concentrated research training. Two sorts of responses are significant--the extent of "no response," and the rank order In terms of "no response" the largest frequencies were in rank order-- "high scholastic record," "mastery of statistics," "independence of thought and investigation," and "persistence in carrying projects to completion." In terms of rank order the highest ranks were assigned to "high intelligence," "motivation to do research," "originality, creativity and imagination." Lowest ranks were assigned to "mastery of research tools and techniques," "independence of thought and investigation," "persistence on carrying projects to completion."

Table 25. Objectives In The Research Training of The Typical Doctoral Students In Your Department?

		Yes	Don't know
To read and understand the general and some of the technical professional literature	N	158	5
	%	83.2	2.6
To read and understand most of the technical professional literature outside of education	N	80	27
	%	42.1	14.2
To write research reports	N	135	11
	%	71.1	5.8
To collect, tabulate, and analyze data on assigned problems	N	143	9
	%	75	4.7
To devise appropriate data collection procedures and instruments	N	118	20
	%	62.1	10.5
To define researchable problems within a problem area	N	140	13
	%	73.7	6.8
To select and use appropriate statistical procedures	N	138	16
	%	72.6	8.4
To devise research plans or strategy	N	103	23
	%	54.2	12.1
To design, execute, and interpret studies that are needed for practical solutions to immediate problems	N	129	19
	%	67.9	10.0
To design and carry out original studies that represent fundamental contributions to knowledge	N	100	27
	%	52.6	14.2
To direct the research of other people	N	53	37
	%	27.9	19.5

Table 26. Rank Order Of The Five Most Important Personal Characteristics Significant In Selection Of People For Concentrated Research Training

		No	R A N K				
		Response	1	2	3	4	5
High intelligence	N	99	46	13	14	7	11
	%	52.1	24.2	6.8	7.4	3.7	5.8
High scholastic record	N	175	3	5	2	2	3
	%	92.1	1.6	2.6	1.1	1.1	1.6
Originality, creativity, and imagination	N	92	26	30	19	11	12
	%	48.4	13.7	15.8	10.0	5.8	6.3
Curiosity and enjoyment of intellectual exploration	N	111	14	22	19	9	15
	%	58.4	7.4	11.6	10.0	4.7	7.9
Persistence in carrying projects to completion	N	115	4	11	14	17	29
	%	60.5	2.1	5.8	7.4	9.0	15.3
Independence of thought and investigation	N	133	4	9	15	21	8
	%	70.0	2.1	4.7	7.9	11.1	4.2
Knowledge of field in which he would do research	N	99	14	16	20	25	16
	%	52.1	7.4	8.4	10.5	13.2	8.4
Mastery of research tools and techniques	N	99	5	12	16	31	27
	%	52.1	2.6	6.3	8.4	16.3	14.2
Motivation to do research	N	98	29	19	20	14	10
	%	51.6	15.3	10.0	10.5	7.4	5.3
Mastery of statistics	N	170	0	4	3	4	9
	%	89.5	0.0	2.1	1.6	2.1	4.7

Table 27 summarizes responses to the item: How important do you think the following are in the training of graduate students for educational research work? Most important in terms of respondent judgment were--"An institutional climate that favors research," "a faculty which is actively doing research," "formal course work in research methodology." Least important in respondent replies were--"formal course work in education," "advanced study in an academic subject matter area," and "other." Intermediate in rank order were the responses--"seminars in research," "internship experience in research," and "independent study.

These responses may be contracted with those of the APA Committee* which summarized its point of view as follows:

> Everything we have found points to the fact that course work, formal examination requirements, and anything else that could be standardized concerns what is ancillary to research training. What is of the essence is getting the student into a research environment and having him do research with the criticism, advice and encouragement of others who suffer the same pain and enjoy the same rewards... Research is learned by doing and taught mainly by contagion. Research must first be going on if there is to be research training. What formal courses are offered is no index of quality of department as regards such training; the only adequate index is the eventual productivity of the individuals that the department produces.

Table 27. How Important Do You Think The Following Are In The Training Of Graduate Students For Educational Research Work?

		A	B	C	D	E
An institutional climate which favors research	N	8	3	3	43	133
	%	4.2	1.6	1.6	22.6	70.0
A faculty which itself is actively doing research	N	8	6	6	44	126
	%	4.2	3.2	3.2	23.2	66.3
Formal course work in research methodology	N	10	10	29	63	78
	%	5.3	5.3	15.3	33.2	41.1
Fromal course work outside of Education	N	7	30	52	63	38
	%	3.7	15.8	27.4	33.2	20.0
Advanced study in an academic subject matter area	N	13	20	41	68	48
	%	6.8	10.5	21.6	35.8	25.3
Seminars in research	N	10	13	27	68	72
	%	5.3	6.8	14.2	35.8	37.9
Internship experience in research	N	15	11	35	57	72
	%	7.9	5.8	18.4	30.0	37.9
Independent study	N	17	6	31	68	68
	%	9.0	3.2	16.3	35.8	35.8
Other	N	186	1	0	0	3
	%	97.9	0.5	0.0	0.0	1.6

Legend: A = Trivial B= Useful sometimes C= Useful D = Important
E = Very Important

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*American Psychological Association. "Report of the Seminar on 'Education for Research in Psychology,' July 28 to August 22, 1958." *American Psychologist* 14:167-79, April 1959.

Table 28. Rank Order Of The Frequency Of Positions Held Now By Doctoral Graduates In Your Area.

		Blank	1	2	3	4	5	6	7	8	9
Public school administrator	N	126	25	16	13	3	5	2	0	0	0
	%	66.3	13.2	8.4	6.8	1.6	2.6	1.1	0.0	0.0	0.0
Teachers' College administrator	N	164	4	7	4	4	3	2	1	1	0
	%	86.3	2.1	3.7	2.1	2.1	1.6	1.1	0.5	0.5	0.0
University administrator	N	158	6	7	8	2	2	3	0	3	1
	%	83.2	3.2	3.7	4.2	1.1	1.1	1.6	0.0	1.6	0.5
Public school-teacher, counselor, etc.	N	155	6	9	9	6	0	0	2	1	2
	%	81.6	3.2	4.7	4.7	3.2	0.0	0.0	1.1	0.5	1.1
Teachers' College-Teacher, Counselor, etc.	N	121	26	27	9	5	2	0	0	0	0
	%	63.7	13.7	14.2	4.7	2.6	1.1	0.0	0.0	0.0	0.0
University--Teacher, counselor, etc.	N	105	35	23	23	4	0	0	0	0	0
	%	55.3	18.4	12.1	12.1	2.1	0.0	0.0	0.0	0.0	0.0
Public school-Researcher	N	168	0	2	5	1	4	2	2	1	5
	%	88.4	0.0	1.1	2.6	0.5	2.1	1.1	1.1	0.5	2.6
Teachers' College-Researcher	N	171	1	2	3	2	3	1	4	2	1
	%	90.0	0.5	1.1	1.6	1.1	1.6	0.5	2.1	1.1	0.5
University-Researcher	N	153	4	10	12	3	0	4	2	2	0
	%	80.5	2.1	5.3	6.3	1.6	0.0	2.1	1.1	1.1	0.0

Table 28 presents the rank order of frequency of positions held now by doctoral graduates of the respondent's department. Perhaps the most significant response is the "blank" one. This suggest that respondents in many instances probably did not know where their graduates were located. Among respondents who apparently knew the positons held by their graduates the most frequently held positions were: University--teacher, counselor,... Teachers' College--teacher, counselor, etc.; Public School administrator. The least frequently held positions were those dealing researcher--Public School, Teacher's College, or University.

Table 29 compares requirements for students preparing for academic positions in a university with that of those who will enter public school work. In response to the question, "Are there differences in admission requirements?", 90 per cent answer "yes," but in response to the question, "Are there differences in the requirements to be met for the degree by these two groups?", 77 per cent indicated "No." In response to the item "What doctoral degree is granted for those entering public school work?", 34 per cent indicated the Ed. D., and 10 per cent the Ph. D., and 38 per cent either the Ed. D. or Ph.D. Response to the item "What doctoral degree is granted for those entering university work?" we note, Ed. D. 16 per cent, Ph. D. 17 per cent, and either Ed. D. or Ph. D., 49 per cent. Apparently these responses were able to discern little difference in admission requirements, degree, and degree requirements between students preparing for public school work and those preparing for careers in university work.

Table 29 concludes the presentation of frequency distributions of faculty responses to the questionnaire.

Table 29. Compare The Students Preparing For Academic Positions In A University With Those Who Will Enter Public School Work

		No	Yes
Are there differences in admission requirements?	N	170	18
	%	90.4	9.6
Are there differences in the requirements to be met for the degree by these two groups	N	144	43
	%	77.0	23.0

	Number	Per cent
What doctoral degree is granted for those entering public school work?		
No response	34	17.9
Ed. D.	64	33.7
Ph. D.	19	10.0
Ed. D. or Ph. D	73	38.4
What doctoral degree is granted for those entering university work?		
No response	32	16.9
Ed. D.	31	16.3
Ph. D.	33	17.4
Ed. D. or Ph. D	94	49.5

B. Comparison of Administrator and Faculty Responses

Table 30 to 50 compare responses of faculty and administrators. In Table 30 administrator and faculty responses are compared on actual time devoted to teaching and preferred distribution of time. Chi-square tests of significance indicate no significant difference between faculty and administrator responses. In both groups there is a tendency to prefer less time be devoted to teaching.

Table 30. Actual And Preferred Time in Teaching

	Faculty		Administrator	
Per cent of time	Actual	Preferred	Actual	Preferred
0 - 20	16	21	3	6
21 - 40	27	45	8	10
41 - 60	54	65	13	10
61 - 80	37	24	3	1
81 - 100	28	7	1	1
	162	162	28	28

Chi-square: actual 7.62, preferred 4.17

Table 31 compares actual and preferred distribution of time in administration. There is a significant difference between administrator and faculty on both actual and preferred distribution of time to administration. There is a tendency for both faculty and administrators to prefer less time than actual to be given to administrative work.

Table 31. Actual and Preferred Time in Administration

	Faculty		Administrator	
Per cent of time	Actual	Preferred	Actual	Preferred
0 - 20	102	114	7	11
21 - 40	36	32	9	7
41 - 60	16	9	7	7
61 - 100	8	7	5	9
	162	162	28	28

Chi-square: actual 17.32, $p < .01$; preferred 21.67, $p < .01$

Table 32 indicates actual and preferred distribution of time devoted to research. No significant difference is found in actual distribution; the difference between administrator and faculty is significant at the .05 level on preferred time distribution--faculty would prefer to spend relatively more time on research.

Table 32. Actual And Preferred Time in Research

	Faculty		Administrator	
Per cent of time	Actual	Preferred	Actual	Preferred
0 - 20	109	56	22	14
21 - 40	32	62	6	13
41 - 100	21	44	0	1
	162	162	28	28

Chi-square: actual 4.10; preferred 7.55, $p < .05$

Table 33 presents preferred and actual distribution of time devoted to other activities by faculty and administrators. Chi-squares are not significant.

Table 33. Actual And Preferred Time In Other Activities

	Faculty		Administrator	
Per cent of time	Actual	Preferred	Actual	Preferred
0 - 20	158	156	28	28
21 - 40	4	6	0	0
	162	162	28	28

Chi-square: actual 1.63; preferred 0.20.

Table 34 shows the attitude of faculty and administrators toward emphasis given to research activity at their schools. The chi-square value is significant at the .01 level, and surprisingly because a significant larger proportion of the faculty say that "research activity" is over-emphasized!

Table 34. Faculty Research Activity

	Faculty	Administrators
Under-emphasized	67	12
Appropriately emphasized	72	13
Over-emphasized	22	3
	161	28

Chi-square: 18.12 $p < .01$

Table 35 indicates response to the question, "Are you doing research now?" It appears that a significantly greater number of faculty are doing research, $p < .05$.

Table 35. Are You Doing Research Now?

	Faculty	Administrators
No	49	12
Yes	112	16
	161	28

$p < .05$

Table 36 indicates responses to the item, "Are you primarily a consumer of research?" No significant difference between faculty and administrators was discerned.

Table 36. Are You Primarily A Consumer Of Research?

	Faculty	Administrator
No	92	16
Yes	70	12
	162	28

Table 37 surveys responses to the question," Are you primarily a producer of research?" In both instances the majority indicated "No' by a ratio of about 5 to 1. The difference between faculty and administrator responses is not significant; only 1 out of 6 does research in either group.

Table 37. Are You Primarily A Producer Of Research?

	Faculty	Administrator
No	134	23
Yes	28	5
	162	28

Table 38 summarizes responses to the item: "Are you about equally a producer and consumer of research?" In both cases, administrators and faculty, the response is about the ratio 15 to 10 in favor of a no response; that is, out of 25 people only 10 regarded themselves about equally producers and consumers of research. This is substantially more nearly equal distribution of responses than was true in the case of primarily producers of research.

Table 38. Are You About Equally A Producer And Consumer Of Research?

	Faculty	Administrator
No	96	17
Yes	66	11
	162	28

Table 39. In response to the question, "Is it important for you to do research?", both administrators and faculty expressed a strong need, but the difference between responses of administrators and faculty was not significant. These results should be contrasted with those of tables 35 and 37. One might conclude that although the intentions are favorable to doing research, the performance doesn't seem to be.

Table 39. Is It Important For You To Do Research?

	Faculty	Administrator
No	10	3
Ye	146	24
	156	27

Table 40 summarizes replies to the question, "How important is research in your field?" No significant difference was found between the responses of administrators and faculty. Both agree overwhelmingly that research is essential.

Table 40. How Important Is Research In Your Field?

	Faculty	Administrator
A luxury	7	1
Useful	28	2
Essential	127	25
	162	28

Table 41 considers responses to the question, "What is the attitude of your school toward research?" No significant difference was found between responses of administrators and faculty. In both cases the attitude responses are overwhelmingly favorable to research. Apparently almost everyone seems to be in favor of virtue and research.

Table 41. What Is The Attitude Of Your School Toward Research?

	Faculty	Administrator
Unfavorable	9	1
Indifferent	19	2
Favorable	132	25
	160	28

Table 42 presents responses to the question, "Is most of the research done by the faculty at your school?" The chi-square value of 1.86 for 1 df is not significant even at the .10 level. More administrators than faculty appear to believe that "most of the research is done by faculty at their school," but the difference is not statistically significant.

Table 42. Is Most Of The Research Done By Faculty At Your School?

	Faculty	Administrator
No	72	8
Yes	90	20
	162	28

Tables 42-44 should be read together. Table 43 refers to the question, "Is most of the research done by an institute at your school?" The difference is not significant even at the .10 level of significance. Response is overwhelmingly negative, significantly so, that most research is not done by an institute or organization. As a matter of fact the interview and publications study discloses that this is not so in all schools. There are several schools where an overwhelming majority of the research is done by an institute or research organization. Apparently the respondents from these schools were not aware of the fact or refused to acknowledge it.

Table 43. Is Most Of The Research Done By An Institute At Your School?

	Faculty	Administrator
No	140	27
Yes	22	1
	162	28

Table 44 looks at the question, "Is most of the research done by graduate students at your school?" Faculty are equally divided, administrators are about 1 (negative) to 2 (positive) in their responses. None of the differences in responses were statistically significant. As a matter of fact though, in comparing results of the publications and doctoral theses studies with these responses one is led to conclude that respondents in many instances are either unaware of the facts, or unwilling to face them.

Table 44. Is Most Of The Research Done By Graduate Students At Your School?

	Faculty	Administrator
No	81	10
Yes	81	18
	162	28

Table 45 indicates the "rank order of frequency of publication of studies done at your school" in terms of various types of studies. Faculty and administrator responses are compared. With reference to surveys administrator and faculty responses are significantly different at the .10 level, Chi-square = 8.43 for 4 df. None of the other chi-square values are significant. Surveys remain the most popular type of studies followed by "experimental studies," "discussions of teaching practices," "discussions directed toward improvement of schools and school practices," and "correlational studies."

Table 46 summarizes replies to the item, "How is research supported?" Chi-square values of the comparison of administrator and faculty response are not significant. Again because of multiple responses it is difficult to interpret the results. More faculty than administrators appear to say that research is not supported officially by the institution. The large number of blanks in responses were surprising.

Table 45. Rank Order Of Frequency Of Publication Of Studies Done At Your School

		RANKS				
		1	2	3	4	5
Surveys	Fac.	47	26	8	16	11
	Adm.	6	2	5	3	1
Testing Programs	Fac.	4	8	11	13	6
	Adm.	1	1	2	3	0
Experimental studies	Fac.	20	17	14	11	18
	Adm.	5	6	2	1	1
Discussion toward improvement	Fac.	7	23	13	9	9
	Adm.	1	2	2	4	3
Correlational studies	Fac.	8	15	17	15	8
	Adm.	0	5	3	0	2
Editorial writing	Fac.	8	2	10	5	12
	Adm.	0	2	1	2	2
News report	Fac.	3	3	8	12	6
	Adm.	0	0	1	1	4
Book reviews	Fac.	1	7	4	7	8
	Adm.	0	1	2	1	0
Historical research	Fac.	2	7	7	4	7
	Adm.	1	0	2	3	0
Philosophical research	Fac.	2	1	3	9	3
	Adm.	0	1	0	0	2
Text books	Fac.	2	1	2	1	0
	Adm.	1	0	0	0	0
Discussion of teaching practices	Fac.	22	14	18	12	19
	Adm.	5	3	1	2	2
Inspirational professional writing	Fac.	10	8	13	10	13
	Adm.	3	0	1	1	4

Table 46. How Research Is Supported

		Blank	Marked
Not supported officially	Fac.	94	68
	Adm.	13	15
Grant from institution	Fac.	131	31
	Adm.	25	3
Grant from outside agency	Fac.	117	45
	Adm.	23	5

Table 47 considers a variety of factors influencing research productivity. Relative to the factor of "associates," the difference between faculty and administrators is not significant. Associates with research interests similar to one's own appear to be least frequently mentioned as very important. "Associates who are actively doing research" appear to be most frequently mentioned as a factor influencing research productivity.

Relative to the time factor reduced teaching load is most frequently mentioned as very important by both faculty and administrators; faculty meetings at which research is discussed is least frequently mentioned. Differences between faculty and administrator responses were not significant.

Incentives or encouragement toward research productivity include both "promotion and salary" and "assistance in seeking funds for research." Differences between responses of faculty and administrator were not significant even at the .10 level.

Organization as a factor in aiding faculty research did not reveal any significant difference in faculty and administrator responses.

In terms of facilities as factors influencing research productivity eight factors are listed. Differences, between responses of administrators and faculty, significant at the .10 level were found for "financial support for the purchase of equipment," "financial support for publication costs," and "financial support for computing costs." Apparently administrators felt that these were very important to research productivity. The difference between administrator and faculty responses, was significant at the .02 level for the item "financial support for bringing lecturers to the campus"--a significantly greater proportion of the administrators felt it was important or very important.

On the whole more administrators than faculty tended to mark items dealing with facilities as factors in research productivity very important, --a response stereotypy.

The next section of table 47 presents data relative to various forms of assistance as factors influencing research productivity. The only item in which there was a significant difference between faculty and administrator responses was in terms of "consulting help in formulating problem, design analysis, etc." This difference was significant at the .01 level because proportionately more administrators than faculty regarded it as "very important." No significant differences were discerned relative to "clerical and statistical assistance;" "help in preparing proposals for

for outside support;" "secretarial and typing assistance;" "help in designing, obtaining, or using measuring and data collecting devices," and "computing facilities."

Relative to graduate students as a factor influencing research productivity no differences, between faculty and administrators, that was significant could be found. Both agree that "capable graduate assistance" and "students actively interested in research" were "important" or "very important" factors.

Table 47. Factors Influencing Research Productivity

		Not Important	Important	Very Important
Associates:				
Speak out for research	Fac.	23	68	71
	Adm.	3	10	15
Actively do research	Fac.	10	53	99
	Adm.	1	11	16
Research similar to yours	Fac.	54	73	35
	Adm.	14	10	4
Time:				
Reduced teaching load	Fac.	11	40	111
	Adm.	3	5	20
Sabbatical leave	Fac.	31	69	62
	Adm.	5	10	13
Faculty meetings	Fac.	49	79	34
	Adm.	5	13	10
Encouragement:				
Promotion and salary	Fac.	14	51	97
	Adm.	5	6	17
Seeking funds for research	Fac.	14	50	98
	Adm.	2	6	20
Organization:				
Aiding faculty research	Fac.	32	70	60
	Adm.	5	9	14
Facilities:				
Space	Fac.	11	73	78
	Adm.	1	10	17
Equipment	Fac.	14	58	90
	Adm.	1	9	18
Library	Fac.	10	35	117
	Adm.	1	6	21

Table 47 (Continued)

		Not Important	Important	Very Important	
Facilities (continued)					
Financial support for:					
Purchase of equipment	Fac.	21	75	66	
	Adm.	1	9	18	$p < .10$
Travel	Fac.	21	57	84	
	Adm.	1	12	15	
Publication costs	Fac.	27	75	60	
	Adm.	1	11	16	$p < .10$
Bringing lecturers to campus	Fac.	46	81	35	
	Adm.	3	12	13	$p < .02$
Computing costs	Fac.	30	77	55	
	Adm.	1	12	15	$p < .10$
Assistance:					
Consulting help in formulating problem, design analysis, etc.	Fac.	23	72	67	
	Adm.	2	8	18	$p < .01$
Clerical and statistical assistance	Fac.	12	57	93	
	Adm.	0	7	21	
Help in preparing proposals for outside support	Fac.	18	91	53	
	Adm.	2	14	12	
Secretarial and typing assistance	Fac.	7	54	101	
	Adm.	0	8	20	
Help in designing, obtaining, or using measuring and data collecting devices	Fac.	13	78	71	
	Adm.	2	11	15	
Computing facilities	Fac.	18	59	85	
	Adm.	4	7	17	
Graduate students:					
Capable graduate assistance	Fac.	5	64	93	
	Adm.	0	8	20	
Students actively interested	Fac.	16	86	60	
	Adm.	1	14	13	

Table 48 is another extensive table that covers "factors or facilities that are provided by the institution" for furthering research. In contrast to the previous table which dealt with respondent's impression of the significance or utility of these factors and/or facilities, Table 48 deals with factors and/or facilities that are in reality presumably provided by the institution. Relative to the factor of "Associates" no significant difference in response of faculty and administrators was found. All three factors--"associates who speak out for and actively support research," "associates actively doing research," and "associates with research interests similar to yours"--were regarded as about equally important by both administrators and faculty.

With reference to the factor of "time" no significant differences between responses of faculty and administrators could be discerned. The most significant datum relative to this factor appears to be the relatively large number of negative reactions. Faculty and administrators alike reacted negatively to "faculty meetings" and "symposia." The former reaction is obviously, the latter more difficult to understand. Perhaps it is a reflection of the nature of the programs.

No differences between faculty and administrator responses, that were significant were noted on the factor of promition and salary. The relatively larger negative and "don't know" responses of faculty may be interesting to follow up. No difference, between faculty and administrator responses that were significant were found relative to the facility of an organization to aid faculty research. In both instances most respondents indicated that the facility was not provided.

No differences, between faculty and administrator responses that were significant were discerned relative to adequacy of facilities provided. Space and equipment facilities were largely give a rating of "no", "insufficient," or "don't know." Relatively few in either group rated them either "adequate" or "generous". "Library seemed to be the item that received more "satisfactory" and "generous" ratings than "no", "insufficient," or "don't know." All of the rest including "financial support for the purchase of equipment," "support for travel to other laboratories or research groups," "support for publication costs," "support for briging lecturers to campus," and "support of computing costs" were much more frequently designated as "no," "insuffiecient" or "don't know" than satisfactory. Both administrators and faculty agreed as to these limitations.

Relative to the item of "assistance" there was a significicent difference at the .05 level, between responses of administrators and faculty on the item of " consulting help in formulating problem, design analysis, etc." Most of the difference seems to occur relative to the negative responses. Apparently few institutions are regarded as "satisfactory" or "generous" in these respects by either faculty or administrators.

In terms of the factor of "graduate students," administrators appear to have significantly more than faculty. This difference is significant at the .01 level. No significant differences were observed between responses of faculty and administrators relative to the duties of graduate assistants as categorized herein, or the number of hours that they worked.

The most significant datum of table 48 is the large number of negative responses. Both administrators and faculty responses agree on this point in most instances. The number of differences that were found to be significant could easily have occurred through random sampling variations along.

Table 48. Facilities Provided By The Institution

		NO	YES	Don't know
Associates:				
Speak out for research	Fac.	21	98	43
	Adm.	7	14	7
Actively do research	Fac.	17	108	37
	Adm.	4	14	10
Research interests similar to yours	Fac.	26	99	37
	Adm.	6	14	8
Time:				
Reduce teaching load	Fac.	74	58	29
	Adm.	14	10	4
Sabtatical leave	Fac.	54	83	25
	Adm.	14	13	1
Faculty meetings	Fac.	99	54	9
	Adm.	15	11	2
Symposium	Fac.	96	49	17
	Adm.	15	11	2

		No	Insufficient	Satisfactory	Generous	Don't know
Financial support:						
Publication	Fac.	54	46	27	3	32
	Adm.	6	14	5	0	3
Bringing lecturers to campus	Fac.	49	38	38	3	34
	Adm.	8	9	8	2	1

Table 48. (Continued)

		No	Insufficient	Satisfactory	Generous	Don't know	
Financial support							
Computing costs	Fac.	39	30	44	18	31	
	Adm.	5	10	8	2	3	
Assistance							
Consulting help in formulating problem design analysis, etc.	Fac.	41	25	57	9	30	
	Adm.	11	6	7	4	0	P <.05
Clerical and statistical assistance	Fac.	39	62	42	3	16	
	Adm	7	13	6	1	1	
Help in preparing proposals for outside support	Fac.	35	32	58	10	27	
	Adm.	6	6	14	0	2	
Secretarial and typing assistance	Fac.	30	72	43	3	14	
	Adm.	6	13	9	0	0	
Help in designing, obtaining, or using measuring data-collecting devices	Fac.	38	37	46	10	31	
	Adm.	6	8	7	4	3	

Graduate students		1	2-6	7-20	
Capable graduate assistants	Fac.	84	69	8	
	Adm.	9	12	6	P <.01

		Teaching Assistant	Research Assistant	Teaching & Research Assistant
Duties of graduate assistants	Fac.	10	9	51
	Adm.	9	2	9

		1-15	16-40
Number of Hours	Fac.	32	43
	Adm.	8	9

Table 49 indicates responses relative to career objectives of doctoral training. No differences, between administrators and faculty, that were significant statistically were found. Negative responses exceeded positive ones for careers in "university administration," "teachers' college professor," "public school teachers," "professional research worker." Positive responses exceeded negative for "public school administration," "university professor," and "education specialists."

Table 49. Career Objectives Of Doctoral Training

		No	Yes
To prepare for:			
University administration	Fac.	142	20
	Adm.	20	7
Public school administration	Fac.	68	92
	Adm.	10	18
University professor	Fac.	68	91
	Adm.	10	18
Teachers' College professor	Fac.	97	62
	Adm.	14	14
Public school teacher	Fac.	121	40
	Adm.	20	7
Professional research worker	Fac.	123	37
	Adm.	22	5
Educational specialist	Fac.	73	84
	Adm.	17	10

Table 50 compares responses of faculty and administrators relative to the basis for admission to the doctoral program. No differences that were significant, even at the .10 level, were found. Negative responses exceeded positive for "teaching experience" and "other." Positive responses exceeded relative to requirements of "bachelor's degree," "master's degree," "entrance examination," and "transcript of undergraduate record."

This concludes the section on frequency distributions. The next section is concerned with the bivariate distributions.

Table 50. Basis Of Admission To The Doctoral Program

		No	Yes
Bachelor's degree	Fac.	63	99
	Adm.	12	16
Master's degree	Fac.	36	126
	Adm.	7	21
Examination	Fac.	48	114
	Adm.	7	21
Undergraduate record	Fac.	71	91
	Adm.	13	15
Teaching experience	Fac.	91	71
	Adm.	15	13
Other	Fac.	126	36
	Adm.	23	5

C. Bivariate Distributions

This section relates response on each item with response on all other items. These cross tabulations were prepared at the University Research Computing Center by means of the Yale Table Program using the CDC 3400-3600 configuration. With 146 items this meant that $\frac{146}{2}$ (145) or 10,585 bivariate tables were prepared. This program cross tabulates responses on the pair of items of concern, and computes the chi-square values. This output yields a pile of printouts about two feet thick. These were visually scanned. The conclusion was that the number of significant differences identified did not exceed the number one would expect through random sampling variations alone. The various comparisons can be seen from the following code sheets;

CODE SHEET FOR BIVARIATE DISTRIBUTIONS OF RESPONSES TO ITEMS ON FACULTY QUESTIONNAIRE

Faculty: Professor, Associate professor, Assistant Professor, Instructor, Lecturer, Teaching Associate, Research Associate

Administrator: Coordinator, Supervisor, Department Head, Director, Dean

Actual time teaching
Actual time administrating
Actual time research
Actual time other
Preferred time teaching
Preferred time administrating
Preferred time research
Preferred time other

Doing research now
Consumer of research
Producer of research
About equally a consumer and a producer

Is it important for you to do research
Its importance in your field
Attitude of school toward research
Faculty research activity

Most of research done by faculty members
Most of research done by research institute
Most of research done by Graduate Students

Rank order of this type of publications by your school
Testing programs (publications) - Rank order
Correlational studies - Rank order of this type of publications by your school
Experimental studies (publications) - Rank order
Discussions directed toward improvement of teaching (publications)-Rank order by your school
Discussions of teaching practices - Rank order of publications
Inspirational professional writing-Rank order of publications
Editorial writing -Rank order of publications
News reports - Rank order of publications of your school
Book reviews - Rank order of publications
Historical research- Rank order of publications of your school
Philosophical research - Rank order of publications of your school
Text books - rank order of publications of your school

Research is not supported officially
Research is supported: By a grant from the institution
- By a grant from an outside agency

Research productivity: Associates speak out for research
- Associates actively do research
- Associates whose research interests are similar to yours
- Reducing teaching load
- Sabbatical leaves
- Faculty meetings
- Promotion and salary
- Administration actively seeking funds for research
- Organization for aiding faculty research
- Space for research needs
- Equipment for research
- Library resources
- Financial support for purchase of equipment
  - Travel to research meetings
  - Publication costs
  - Bringing lecturers to campus
  - Computing costs
- Consulting help in formulating problems, design, etc.
- Clerical and statistical assistance
- Help in preparing proposals for outside support
- Typing assistance
- Help in developing measuring and data-collecting devices
- Computing facilities
- Capable graduate assistance
- Students actively interested in research as a future career
- Direct support: Actually associates endorse research
  - Actually associates are actively doing research
  - Actually research interests of your associates are similar to yours
  - Number of faculty members in Education school
  - Actually teaching load is reduced to aid research
  - Actually sabbatical leave is available to those interested in researcl
  - Symposia on research are held
  - Actually faculty meetings related to research are held
  - Actually research is an important consideration in promotion and salary increments
  - Actually there is a formal organization to aid Educational Research
  - Actually space is provided for faculty research
  - Actually equipment is provided for faculty
  - Actually library facilities are available
  - Actually financial support is provided for purchase of equipment
    - Travel to meetings
    - Publication costs
    - Bringing research lecturers to campus
    - Computing costs

Direct support: Actually consulting help is provided
Actually clerical assistance is provided
Actually typing assistance is provided
Actually help in making proposals is provided
Actually help in developing measuring and data-collecting devices is provided
Number of graduate students
Duty of graduate assistants
Number of hours of work per week-graduate assistants
To prepare university administration objectives of education doctoral training
To prepare public school administration objectives
To prepare university professor objectives of education doctoral training
To prepare teachers for teachers' college objectives
To prepare public school teachers objectives
To prepare researchers objectives
To prepare education specialists objectives
Basis for doctoral program recruitment: Bachelor's degree
Master's degree
Examination
Undergraduate records
Other administration requirements
In his future work, would the typical doctoral graduate in your area be required to conduct independent research
Is typical doctoral graduate in your area adequately prepared to do independent research
Is research training an important part of your doctoral program
Actually how much emphasis is given to educational research training? Research training receives equal emphasis.
Actually research training is only a peripheral activity
Actually all doctoral students are prepared to be intelligent consumers of research.
Actually all doctoral students are prepared to be independent producer of research
Research training should: receive equal emphasis
Be only a peripheral activity
Objectives of research training: to read general literature
To read technical literature
To write research reports
To collect and analyze data
To devise instruments
To define problems
To use appropriate statistical procedures
To develop new statistical procedures

Objectives of research training: to devise research plans
    To carry out original studies
    To direct research
Importance of educational research training: institutional climate which
    favors research
    Faculty actively doing research
    Course work in research methodology
    Course work outside of education
    Advanced study in a subject matter area
    Seminars in research
    Internship in research
    Independent studies
Rank order of the most important personal characteristic in the selection
  of students for research training: Hi I. C.
    High scholastic record
    Originality
    Curiosity
    Persistence
    Independence of thought
    Knowledge of field
    Mastery of research tools
    Motivation to do research
    Mastery of statistics
Rank order of the position held now by those doctoral graduates during
  the past five years: Public school administrators
    Teachers' college administrators
    University administrators
    Public school teachers
    Teachers' college instructors
    University professor
    Public school researchers
    Teachers' college researchers
    University researchers
Are you doing research now? Primarily a consumer of research
    Primarily a producer of research
    About equally a consumer & a producer
    Is it important for you to do research
    How important is research in your field
    Attitude of school toward research
    Faculty research activity
    Most of research done by faculty members
    Most of research done by research institute
    Most of research done by graduate students

Number of bivariate tables is $\frac{146}{2}(145) = 10585$

CRITICAL CHI-SQUARE VALUES

df	P 0.10	.05	.02	.01
1	2.71	3.84	5.41	6.64
2	4.60	5.99	7.82	9.21
4	7.78	9.49	11.67	13.28
8	13.36	15.51	18.17	20.09
16	23.54	26.30	29.63	32.00

CHAPTER III

GRADUATE STUDENT QUESTIONNAIRE STUDY

A copy of the Graduate Student Questionnaire is given in Appendix D. The procedure in developing these items was to use the Input-Process-Output outline and the outline of the "Items to be covered by the questionnaire and interview schedules" of Appendix B as the blueprint. A preliminary form was developed and tried out in a pilot study with 50 graduate students at two adjoining schools not included in the study. After analysis of the pilot study information, the form was revised into the graduate student questionnaire used in the present study. The Research Characteristics Survey and the Opinion Survey forms of the pilot study (pp. 14-20, Appendix C) were not used in the study itself because they did not appear to add sufficient new information to justify their inclusion.

Sample: The sampling procedure was developed by means of discussions with the executive secretary and others at the International Headquarters of Phi Delta Kappa. The list of local chapters was obtained. This included the name of the chapter president. A letter was written to each chapter president explaining the project, indicating that discussions were held with national officers, and that their approval had been secured. Cooperation of the chapter officers was solicited in distributing the graduate student questionnaire to the graduate students engaged in empirical quantitative research. If they agreed to cooperate they were asked for an indication of the number of potential graduate student respondents. The function of the local chapter officers was merely to distribute the questionnaires (that we mailed in a single large package) to the graduate students. This is not a random sample, and it is not necessarily representative of all the graduate students in education at these schools. It is, hopefully, a purposive sample representative of the graduate students doing empirical research, but there was no easy way that we could compute sample reliability, so this remains an unknown factor.

About 2500 questionnaires were distributed through local chapters. Responses were mailed by each respondent directly to the project headquarters in the self-addressed stamped envelopes provided. Returns were recevied at the Institute of Educational Research, Indiana University, 329 S. Highland Avenue, Bloomington, Indiana. Approximately 650 or 26 per cent returns were received. Response rate varied from about zero to almost 80 per cent, the average being under 30 per cent. A random sample, using the Fisher-Yates tables of random numbers, of one-half of returns were taken for detailed analyses.

Procedure Frequency distributions of responses, were first prepared. Then responses of Ed. D. and Ph. D. candidates were tabulated and compared; chi-square tests of significance were computed. Finally, the most extensive tabulations--the bivariate frequency distributions that compared frequency of responses to each item with that of every other item were tabulated using the Yale Table Program* on the CDC 3400-3600 configuration. With 67 items 2211 tables were prepared; chi-square values were computed and checked for significance. These tabulations number $\frac{67}{2}$ (66) or 2211 bivariate tables. Less than 10 per cent of the chi-square values were significant at the .10 level suggesting that the differences that were found to be significant could easily be accounted for through sample random sampling variations.

Background: Before turning to discussion of results it may be useful to examine the background of graduate students in the United States. About a quarter of all graduate students are in physical and life sciences. About 40 per cent are in education and less than 15 per cent are in the social sciences. The remainder are in various fields.

Table 51 indicates the percentage distributions of Ph. D.'s by field for selected years.

Table 51. Percentage Distribution Of Ph. D.'s By Field, Selected Years

Field	1926 -30	1936 -40	1946 -50	1956 -57
Natural sciences	44.2	47.6	38.3	31.7
Applied biology (Ag. -HE)	1.5	2.2	4.8	3.8
Engineering	1.7	2.1	5.6	6.8
Social sciences (Economics, History, other, fairly even distribution)	16.9	15.2	13.1	12.5
Psychology	4.6	4.1	4.1	6.3
Humanities and Arts (English, Language, Philosophy, Fine Arts) (English 4.0 rest even)	17.1	17.9	15.3	10.3
Health Fields	0.0	0.5	1.0	1.7
Business and Commerce	0.0	0.0	0.7	1.1
Education	13.4	9.9	14.2	17.5
Other (Law, Miscellaneous)	0.6	0.5	2.9	8.3

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*Original obtained from Yale University Computing Center, 62 New Haven St., New Haven, Conn. The version used here was a modification prepared by the Research Computing Center, Indiana University.

Table 52 indicates the aptitude score distribution of graduate students in various fields. Education and business share the position with the lowest median score.

Table 52. Aptitude Test Score Distributions Of Graduate Students In

Field	50th Percentile Score
Natural science	128
Engineering	126
Psychology	132
Social science	124
Humanities and art	125
Medicine	127
Business and Commerce	121
Education	121

In Table 53 indicates the percentage of undergraduates in various fields scoring above the median score of all undergraduates in 1951. Education has the lowest percentage attaining the group median or better score, 20 per cent.

Table 53. Percentage of Undergraduates Scoring 130 or Higher On The AGCT Classification Test by Field of Study, 1951

Field of Study	Per cent of students scoring 130 or higher
All fields	50
Biological Sciences	46
Engineering	67
Physical sciences and mathematics	68
Humanities	48
Social sciences	51
Education	20
Business and commerce	43
Agriculture	29
Miscellaneous	29

Turning back to graduate work, a few universities have always awarded a high proportion of the Ph. D degrees in this country. In the academic year 1955-56, only 158 colleges and universities awarded a Ph. D degree. Within this group, 9 universities awarded 200 or more Ph. D degrees. These 9 (or 6 per cent of the group) granted 36 per cent of all Ph. D degrees.

Results:

Results are presented under three headings:

A. Frequency Distributions
B. Comparison of Ed. D. and Ph. D candidate resonses
C. Bivariate distributions

A. Frequency Distributions of Graduate Student Responses

Table 54 indicates the distribution of graduate student respondents according to the degree sought. The number of Ph. D candidates slightly exceeds the Ed. D.'s. About 47 per cent of the group were pursuing the Ed. D. and 51 per cent the Ph. D.

Table 54. Degree Sought

	Number	Per cent
Ed. D.	149	47.3
Ph. D	162	51.4
Ed. S.	1	0.3
No response	3	1.0

Table 55 shows the major and minor fields of study of respondents. School administration was the most popular major; Counseling and Educational Psychology were next in order. Their combined enrollment equalled the number in administration. These three fields account for about half of all graduate students' majors. Minor fields enrollment was greatest outside of education. About 30 per cent indicated no minor.

Table 55. Field of Study

	Major		Minor	
	Number	Per cent	Number	Per cent
No response	2	0.6	94	29.8
Adult education	7	2.2	1	0.3
Audio visual	2	0.6	0	0.0
Business education	6	1.9	2	0.6
Counseling	40	12.7	15	4.8
Curriculum	14	4.4	7	2.2
Educational Psychology	39	12.4	15	4.8
Elementary education	21	6.7	4	1.3
General education	30	9.5	46	14.6
Higher education	20	6.3	8	2.5
Philosophy of education	3	1.0	0	0.0
Physical education	4	1.3	4	1.3
Reading	1	0.3	2	0.6
Research	4	1.3	4	1.3
School administration	81	25.7	14	4.4
Secondary education	13	4.1	11	3.5
Special education	3	1.0	5	1.6
Vocational education	1	0.3	3	1.0
Industrial arts	4	1.3	0	0.0
Teacher education	13	4.1	0	0.0
Comparative education	3	1.0	0	0.0
Mathematics education	3	1.0	2	0.6
Science education	1	0.3	1	0.3
Outside of Education			77	24.4

Table 56 indicates the type of position that candidates hope to get after graduation. Almost 40 per cent hope for positions in a college or university, another 13 per cent would like to be in some sort of college administrative post.

Table 56. What Type Of Position Do You Hope To Get After Graduation?

	Number	Per cent
No response	21	6.7
College instructor	122	38.7
Teacher trainer	9	2.9
Public school teacher	1	0.3
Counselor	14	4.4
School psychologist	14	4.4
Researcher	12	3.8
Education editor	1	0.3
University librarian	1	0.3
Professional assistant specialist	3	1.0
College Administrator	30	9.5
Dean of students	9	2.9
College department head	3	1.0
Director of student teaching	3	1.0
Research director	2	0.6
Curriculum director	4	1.3
Director of counseling	4	1.3
Director of special education	2	0.6
Public school administrator	33	10.5
High school principal	16	5.1
Elementary school principal	2	0.6
Educational T.V. director	3	1.0
Training director	4	1.3
Undecided	2	0.6

Table 57 shows that a majority of respondents, about 62 per cent, believe that their future work will require proficiency in research. Another 21 per cent indicated that they did not know, but 17 per cent thought their future work would not require competence in research.

Table 57. Will Your Future Work Probably Require Competence In Research?

	No	Yes	Don't know
Number	53	195	67
Per cent	16.8	61.9	21.3

Table 58 summarizes responses to the item: "Would you enjoy doing research as a part of your future work?" About 71 per cent indicated "yes", another 15 per cent indicated "undecided." But 14 per cent said "No."

Table 58. Would You Enjoy Doing Research As A Part Of Your Future Work?

	Number	Per cent
No	44	14.0
Yes	224	71.1
Undecided	47	14.9

Table 59 presents a variety of responses to the item: "What has been the extent of your experience with educational research?" About 75 per cent indicated that results of research were regularly discussed in graduate education courses. This item, as well as the others does not explore the nature or depth of these discussions--only that the respondent thinks such discussions were held.

About 81 per cent indicated that reading of research was required in graduate education courses. One wonders what was required of the other 19 per cent.

Conducting research studies was designated as a requirement in graduate education courses by 54 per cent of the respondents. As to formal courses in research methodology about 29 per cent of the group indicate they had one, 29 per cent two and 11 per cent three; 25 per cent of the group left their response blank. With reference to seminars in research, 64 per cent left the response blank suggesting that they could not identify any. About 20 per cent had one seminar and an additional 11 per cent had two seminars.

Graduate assistantships in research were held by about 26 per cent of the group. Almost 65 per cent were working on a thesis, and about 14 per cent indicated "other" but unspecified experience in research.

Table 59. What Has Been The Extent Of Your Experience With Educational Research?

		Blank	Yes
Results of research are regularly discussed in graduate education courses.	N	80	235
	%	25.4	74.6
Reading of research is a requirement in graduate education courses.	N	61	254
	%	19.4	80.6
Conducting research studies is a requirement in graduate education courses	N	144	171
	%	45.7	54.3
Formal courses in research methodology	N	78	235
	%	24.8	75.2

		1	2	3	4	5	6
Number of courses	N	90	90	35	16	2	2
	%	28.8	28.8	11.2	5.2	0.6	0.6

		Blank	Yes
Seminars in research	N	200	115
	%	63.5	36.5

		1	2	3	4	5
Number of seminars	N	63	35	8	7	2
	%	20.1	11.1	2.5	2.2	0.6

		Blank	Yes
Graduate assistantship in research	N	234	81
	%	74.3	25.7
Thesis	N	111	204
	%	35.2	64.8
Other	N	271	44
	%	86.0	14.0

Table 60 presents responses to the item: "To what extent do you believe yourself prepared to do independent research in your area?" About 26 per cent feel they have little or no competence, 15 per cent feel completely confident. This response is probably as much a reflection of a personality trait of confidence, as it is a reflection of the ability of the individual to perform.

Table 60. To What Extent Do You Believe Yourself Prepared To Do Independent Research In Your Area:

	Number	Per cent
None	13	4.1
Little	69	21.9
Some	186	59.1
Completely	47	14.9

Table 61 considers responses to the item: "What emphasis do you think should be given to research training in a school of education?" A minority of 41 per cent indicated that they believed emphasis given to research should be equal to that given to the development of professional (?) competence. Almost one-fourth, 24 per cent, indicated that research should be treated as a peripheral activity in their training, but approximately 95 per cent indicated a belief that all graduate education students should be prepared to be intelligent interpreters of research. One again wonders at the denotation and connotation. of research interpretation that these people hold. One wonders if they understand that there is much more to being an interpreter of research than merely reading the words. Almost 46 per cent believed that all students should be prepared to become independent producers of research.

Table 61. What Emphasis Do You Think Should Be Given To Research Training in A School Of Education?

		Yes	No	Don't know
Equal emphasis to research	N	128	147	40
	%	40.6	46.7	12.7
Only as a peripheral activity	N	77	206	32
	%	24.4	65.4	10.2
All students should be prepared to be intelligent interpreters	N	298	10	7
	%	94.6	3.2	2.2
All students should be prepared to be independent producers	N	146	122	47
	%	46.4	38.7	14.9

Table 62 summarizes responses to the item: "Within your school of education, how much emphasis is actually given to research training." Responses here should be contrasted with those of table 61 which indicated *should*. About 26 per cent indicated that equal emphasis *is* given, 41 per cent said *should*. Almost 36 per cent indicated that research training *was* a peripheral activity, 24 per cent indicated *should*. Around 63 per cent said all students *were* being prepared as interpreters of research, 95 per cent said *should*. Approximately 30 per cent indicated that all students *were* being prepared as producers of research, 46 per cent said *should*. These responses suggest that on the whole graduate students as a group believe they should have had more research training than they were getting.

Table 62. Within Your School Of Education, How Much Emphasis Is Actually Given To Research Training?

		No	Yes	Don't know
Equal emphasis	N	210	81	24
to research training	%	66.7	25.7	7.6
Research training is	N	165	114	36
a peripheral activity	%	52.4	36.2	11.4
All students are prepared as interpreters	N	72	198	45
of research	%	22.9	62.9	14.3
All students are prepared as producers	N	146	96	73
of research	%	46.4	30.5	23.2

Table 63 shows responses to the item: "How important do you think the following are in the preparation of students for educational research work?" An institutional climate that favors research was regarded as "important" or "very important" by about 93 per cent; a faculty actively engaged in research was said to be "important" or "very important" by 87 per cent; formal course work in research methodology was indicated as important" or "very important" by 78 per cent; formal course work outside the field of education was said to be "important" or "very important" by about 50 per cent; advanced study in academic subject matter was stated as "important" or "very important" by 62 per cent; seminars in research were "important" or "very important" to 56%; independent study was 'important" or "very important" to 75 per cent. On the whole these responses of graduate students as a whole parallel those of the faculty as a whole. Faculty would place more reliance on independent study and internship experience and less on formal course work.

Table 63. How Important Do You Think The Following Are In The Preparation Of Students For Educational Research Work?

	Number	Per cent
Institutional climate that favors research.		
Trivial	4	1.3
Some use	3	1.0
Useful	16	5.1
Important	103	32.7
Very important	189	59.9
Faculty actively doing research		
Trivial	4	1.3
Some use	4	1.3
Useful	33	10.5
Important	121	38.4
Very important	153	48.5
Formal course work in research methodology		
Trivial	5	1.6
Some use	13	4.1
Useful	52	16.5
Important	102	32.3
Very important	143	45.5
Formal course work outside the field of Education		
Trivial	11	3.5
Some use	32	10.1
Useful	115	36.5
Important	88	27.9
Very important	69	22.0
Advances study [illegible] academic subject matter		
Trivial	10	3.2
Some use	33	10.5
Useful	76	24.1
Important	113	35.9
Very important	83	26.3
Seminars in research		
Trivial	6	1.9
Some use	25	7.9
Useful	69	21.9
Important	107	33.9
Very important	108	26.4

Table 63 (Continued)

	Number	Per cent
Internship experiences		
Trivial	12	3.8
Some use	30	9.5
Useful	95	30.2
Important	92	29.2
Very important	86	27.3
Independent study		
Trivial	13	4.1
Some use	14	4.4
Useful	53	16.8
Important	120	38.1
Very important	115	36.5
Other		
Trivial	287	91.1
Some use	1	0.3
Useful	2	0.6
Important	7	2.2
Very important	18	5.8

Table 64 considers responses to the item: "How would you describe the attitude of your school of education toward research?" About 88 per cent indicated a favorable response.

Table 64. How Would You Describe The Attitude Of Your School Of Education Toward Research?

	Number	Per cent
Unfavorable	7	2.2
Indifferent	31	9.8
Favorable	277	88.0

Table 65 indicates responses to the item "Rank order of performance of educational research at your institution?", 40 per cent said graduate students were rank 1 performers of educational research, 25 per cent said individual faculty members were rank 1, and 12 per cent said a formal organization was rank 1. These differ significantly from faculty responses. Faculty indicated they were rank 1. Data on publications would tend to support the position of graduate students.

Table 65. Rank Order of Those Who Actually Do Educational Research At Your Institution

	Number	Per cent
Graduate students		
No response	68	21.6
Rank 1	125	39.7
2	70	22.2
3	52	16.5
Individual Faculty members		
No response	73	23.2
Rank 1	80	25.4
2	133	42.2
3	28	8.9
4	1	0.3
Formal organization		
No response	122	38.7
Rank 1	37	11.8
2	39	12.3
3	106	33.7
4	11	3.5
Other		
No response	293	93.0
Rank 1	5	1.6
2	1	0.3
3	9	2.9
4	7	2.2

Table 66 indicates response to emphasis on faculty research; about 9 per cent say faculty research is overemphasized and 34 per cent underemphasized.

Table 66. Faculty Research Activity In This School Of Education Is:

	Number	Per cent
Underemphasized	106	33.7
Proper emphasized	181	57.5
Overemphasized	28	8.8

Table 67 shows responses to the item dealing with the rank order assigned to the five most important personal characteristics of a successful research worker. The most significant datum is the large proportion in the "no response" category. Considering only the responses we find the rank order of the top five characteristics to be: Motivation, Originality, Curiosity and enjoyment of inquiry, Knowledge of the field, High intelligence. The three lowest were -- "other," mastery of statistics, and high scholastic record.

Table 67. Rank Order Of The Five Most Important Personal Characteristics Of A Successful Educational Researcher.

		No Response	1	2	3	4	5
High Intelligence	N	242	20	13	13	12	15
	%	76.8	6.4	4.1	4.1	3.8	4.8
High scholastic record	N	307	2	3	1	1	1
	%	97.5	0.6	1.0	0.3	0.3	0.3
Originality	N	150	59	46	31	14	15
	%	47.6	18.7	14.6	9.8	4.4	4.9
Curiosity and enjoyment	N	163	39	43	30	20	20
	%	51.8	12.4	13.7	9.5	6.3	6.3
Motivation	N	133	62	40	30	23	27
	%	42.2	19.7	12.7	9.5	7.3	8.6
Persistence	N	164	7	23	36	44	41
	%	52.1	2.2	7.3	11.4	14.0	13.0
Independence	N	197	15	26	27	28	22
	%	62.5	4.8	8.3	8.6	8.8	7.0
Knowledge	N	143	33	23	35	46	35
	%	45.5	10.4	7.3	11.1	14.6	11.1
Mastery of Statistics	N	268	1	4	11	14	17
	%	85.1	0.3	1.3	3.5	4.4	5.4
Mastery of research tools and techniques	N	166	7	23	31	41	47
	%	52.7	2.2	7.3	9.8	13.0	15.0
Other	N	309	1	1	0	1	3
	%	98.1	0.3	0.3	0.0	0.3	1.0

Table 68 indicates response to adjectives that respondent would use to describe educational research at this school. Again the large number of blank responses is a salient fact. Considering this fact, the rank order of adjectives is: 1 useful, 2 important, 3 valuable, 4 practical, 5 interesting, 6 scientific, 7 creative, 8 scholarly, 9 original. Least significant in rank were: 17 worthless, 16 amateurish, 15 inconsequential, 14 rigorous, 13 routine, 12 superficial.

Table 68. Adjectives That You Would Use To Describe Educational Research At Your School

		Blank	Yes
Useful	N	85	230
	%	27.0	73.0
Practical	N	140	175
	%	44.4	55.6
Exciting	N	239	76
	%	75.9	24.1
Original	N	212	103
	%	67.3	32.7
Routine	N	253	62
	%	80.3	19.7
Amateurish	N	267	48
	%	84.8	15.2
Theoretical	N	239	76
	%	75.9	24.1
Creative	N	196	119
	%	62.2	37.8
Inconsequential	N	268	47
	%	85.1	14.9
Superficial	N	249	66
	%	79.1	20.9
Valuable	N	127	188
	%	40.3	59.7
Scholarly	N	199	116
	%	63.2	36.8
Worthless	N	295	20
	%	93.7	6.3
Rigorous	N	255	60
	%	80.9	19.1
Interesting	N	158	157
	%	50.2	49.8
Important	N	121	194
	%	38.4	61.6
Scientific	N	176	139
	%	55.9	44.1

This concludes the section on frequency distributions of graduate student responses.

B. Comparison of Ed. D. and Ph. D. Candidate Responses

Tables 69-80 compare responses of Ed. D and Ph. D candidates on responses to the items of the Graduate Student Questionnaire.

Table 69 indicates that a significantly greater number of Ph. D's are granted in the major area of educational psychology. This difference was significant at the .01 level.

Table 69. Major Field of Study

	Ed. D	Ph. D
Educational Psychology	4	35
Other	145	127
Total	149	272

Chi-square = 23.64, $P < .01$

In table 70 no significant difference could be discerned between Ed. S and Ph. D candidates in terms of the type of position that they hoped to get after graduation.

Table 70. Type of Position You Hope To Obtain After Graduation

	Ed. D	Ph. D
College	20	15
Public school	97	124
Other	18	16
Total	135	155

Table 71 presents data relative to the item: "Will your future work probably require competence in research?" The difference between Ed. D and Ph. D candidates was significant at the .05 level. Significantly more of the PhD candidates believed that research competence would be required.

Table 71. Believe Future Work Will Require Competence In Research

	No	Yes	Undecided
Ed. D	29	84	36
Ph. D	18	113	31
Total	47	197	37

Chi-square = 6.68, P < .05

Table 72 considers the question: "Would you enjoy doing research as a part of your future work?" No differences that were significant were found between Ed. D and Ph. D candidates.

Table 72. Would Enjoy Doing Research As A Part Of Future Work

	No	Yes	Undecided
Ed. D	23	106	20
Ph. D	19	116	27
Total	42	222	47

Table 73 presents data relative to responses on the question: "What has been the extent of your experience with educational research?" No significant differences were evident between the responses of Ed. D and Ph. D candidates -- A. Results of research are regularly discussed in classes: B. Reading of research publications is regularly required in graduate education courses; C. Conducting research studies is a requirement in graduate education courses; D. Formal courses on research methodology are required; G. A thesis is required. On subitem E Seminars in research are given, the difference between Ed. D and Ph. D responses was significant at the .10 level. Apparently Ph. D's said they had significantly more exposures to research seminars. On item F Graduate assistantships in research, the difference was significant at the .05 level. Ph. D's said more often than Ed. D's that they held a graduate assistantship in research.

Table 73. Extent Of Your Experience With Educational Research

		Ed. D	Ph. D
Results of research are regularly discussed in classes	No	38	39
	Yes	111	123
Chi-square = 2.57			
Reading of research publications is required	No	22	36
	Yes	127	126
Chi-square = 2.37			
Conducting research is required in graduate education courses	No	62	87
	Yes	79	83
Chi-square = 1.33			
Courses are offered in research methodology	No	19	49
	1-3	121	100
	4-6	9	13
Chi-square = 1.54			
Seminars in research are given	No	120	67
	1	22	51
	2-5	7	44
Chi-square = 5.29, $P < .10$			
Graduate assistantships in research	No	121	110
	Yes	28	52
Chi-square = 6.51, $P < .05$			
Thesis	No	57	51
	Yes	92	111
Chi-square = 1.29			

Table 74 compares Ed. D and Ph. D candidates' responses to the item: "To what extent do you believe yourself prepared to do independent research in your area?" Ph. D's believe themselves to be better prepared to carry on independent research than Ed. D's. The difference is significant at the .10 level.

Table 74. To What Extent Do You Believe Yourself Prepared To Do Independent Research In Your Field?

	Ed. D.	Ph. D.
Not prepared	4	7
Need much help	41	28
Need some help	87	97
Well prepared	17	30
Chi-square = 6.87, P < .10		

Table 75 is concerned with a value judgment: "What emphasis do you think should be given to research training in a school of education?" No significant differences in responses of Ed. D. and Ph. D. candidates were observed relative to: A. "Emphasis equal to that given in preparation for teaching or administration;" C. "All doctoral students in education should be prepared to be intelligent consumers and interpreters of research;" D. "All doctoral students in education should be prepared to become independent producers of research." On item B "Research training should be only a peripheral activity of the doctoral program; it is not a major objective," there was a difference between responses of Ed. D. and Ph. D candidates that was significant at the .01 level. Ph. D's emphatically denied this statement.

Table 75. Emphasis Research Training Should Receive In Education

		No	Yes	Undecided
Emphasis equal to that for teaching or administration	Ed. D	78	45	26
	Ph. D	65	83	14
Chi-square = 1.55				
Research training should only be a peripheral activity, not a major objective	Ed. D	84	48	17
	Ph. D	118	29	15
Chi-square = 10.01, P < .01				
All doctoral students in education should be prepared to be intelligent consumers of research	Ed. D	1	144	4
	Ph. D	7	152	3
All doctoral students in education should be prepared to be independent producers of research	Ed. D	62	65	22
	Ph. D	58	79	25
Chi-square = 1.14				

Table 76 parallels 75. The preceding dealt with the question of ought, the present with the question of is. Responses to the question: "Within your school of education, how much emphasis is actually given to research training?" Responses to item A. "Research receives emphasis equal to that given for teaching or administration" indicated that Ph. D and Ed. D response differed sufficiently to be significant at the .05 level. Ph. D's felt that their training for research did receive equal emphasis more often than Ed. D's felt that way. Response to item B. "Research training is only a peripheral activity at this school" did not discriminate between Ed. D's and Ph. D's. Item C. "All doctoral students are trained to be intelligent users and interpreters of research" showed no discrimination. Both Ed. D's and Ph. D's said "yes" about three times as often as they said no. Similarly on item D. "All doctoral students are trained to be independent producers of research" there was no significant difference between responses of Ed. D. and Ph. D candidates. "No" and "Undecided" categories were checked more than twice as often as "Yes." Apparently the differences between Ed. D. and Ph. D are not great on the whole. However, the Ph. D candidates appear to put regard on research as a more significant part of their training than Ed. D.'s

Table 76. How Much Emphasis Is Actually Given To Research Training?

		No	Yes	Undecided
Research receives emphasis equal to that given for teaching or administration	Ed. D	109	28	12
	Ph. D	99	52	11
Chi-square = 7.19, P < .05				
Research training is only a peripheral activity in this school	Ed. D	73	63	13
	Ph. D	89	51	22
All doctoral students are trained to be intelligent users and interpreters of research	Ed. D	35	96	18
	Ph. D	35	100	27
All doctoral students are trained to be independent producers of research	Ed. D	73	49	27
	Ph. D	71	46	45

Table 77 presents responses to the question: "How important are the following in the preparation of students for educational research work?" The items that showed no significant differences between responses of Ed. D's and Ph. D's were: A. "An institutional climate favorable to research;" D. "Course work in logic, mathematics, experimental psychology;" F. "Seminars in research;" G. "Internship experience in research;" and H. "Independent study." On item B. "Faculty actively doing research' the difference in Ph. D and Ed. D. candidate response was significant at the .05 level; most of the difference occurs in the "useful" category. On item E "Advanced study in an academic subject matter" the difference was significant at the .10 level. It should be noted that these significant differences can easily be accounted for by random sampling variations. It would be hazardous to claim that they are really significant.

Table 77. How Important Are The Following In The Preparation Of Students For Educational Research Work?

		Useful	Important	Very Important
Institutional climate favorable to research	Ed. D	21	63	65
	Ph. D	18	57	87
Chi-square = 3.18				
Faculty actively doing research	Ed. D	27	42	80
	Ph. D	40	59	63
Chi-square = 6.87, P < .05				
Course rank in research methodology	Ed. D	80	36	33
	Ph. D	75	52	35
Chi-square = 2.59				
Course work in logic, mathematics, experimental psychology	Ed. D	59	55	35
	Ph. D	58	57	47
Chi-square = 1.29				
Advanced study in an academic subject matter	Ed. D	53	54	42
	Ph. D	44	52	66
Chi square = 5.67, P < .10				
Seminars in research	Ed. D	30	60	59
	Ph. D	48	59	55
Chi-square = 3.77				
Internship experience in research	Ed. D	139	3	7
	Ph. D	147	4	11
Chi-square = 7.13				
Independent study	Ed. D	2	15	132
	Ph. D	3	16	143
Chi-square = 1.29				

Table 78 summarizes responses on the question of "Extent of emphasis on faculty research at this school?" No significant differences in responses of Ed. D and Ph. D candidates was detected.

Table 78. Emphasis On Faculty Research At This School

	Under emphasized	Appropriately emphasized	Over emphasized
Ed. D	58	78	13
Ph. D	46	102	14
Chi-square = 4.08			

Table 79 summarizes responses to the rank order of the five most important personal characteristics of a successful educational researcher. No significant differences were detected between responses of Ed. D and Ph. D candidates on the various characteristics: A. High intelligence, B. High scholastic record; C. Originality, creativity, imagination; D. Curiosity and enjoyment of intellectual exploration, E. Motivation or drive to do research, F. Persistence in carrying projects to completion; G. Independence in thinking and investigation, H. Knowledge of field in which he would do research; I. Mastery of statistics, and J. Mastery of research tools and techniques.

Table 79. Personal Characteristics Of The Successful Educational Researcher

		1	2	3	4	5
High intelligence	Ed. D	130	6	4	3	6
	Ph. D	128	7	9	9	9
Chi-square = 3.08,						
High scholastic record	Ed. D	147	1	1	0	0
	Ph. D	159	2	0	1	0
Chi-square = 2.26						
Originality, creativity, imagination	Ed. D	97	27	13	4	8
	Ph. D	108	19	18	10	7
Chi-square = 4.89						
Curiosity and enjoyment of intellectual exploration	Ed. D	89	20	19	9	12
	Ph. D	110	23	10	11	8
Chi-square = 5.68						
Motivation to do research	Ed. D	90	21	15	12	11
	Ph. D	101	19	15	11	16
Chi-square = 1.16						

Table 79 (Continued)

		1	2	3	4	5
Persistence in carrying projects to completion	Ed. D	72	13	19	27	18
	Ph. D	96	9	17	17	23
Chi-square = 6.61						
Independence of thought and investigation	Ed. D	103	11	15	11	9
	Ph. D	105	15	12	17	13
Chi-square = 2.44						
Knowledge of field in which he would do research	Ed. D	84	6	15	25	19
	Ph. D	89	17	20	20	16
Chi-square = 6.40						
Mastery of statistics	Ed. D	126	2	4	8	9
	Ph. D	139	2	7	6	8
Chi-square = 1.26						
Mastery of research tools and techniques	Ed. D	76	13	15	20	25
	Ph. D	93	10	16	21	25
Chi-square = 1.81						

Table 80 presents responses of Ed. D and Ph. D candidates on the item: "Adjectives that you would use to describe productive educational researchers at your school. There were no significant differences in the responses of Ed. D and Ph. D candidates to any of the 17 adjectives.

Table 80. Adjective Check List Frequencies Used to Describe Research

	Ed. D	Ph. D	Blank
Useful	113	115	83
Practical	86	87	138
Exciting	34	41	236
Original	44	57	210
Routine	116	133	62
Amateurish	23	24	264
Theoretical	37	38	236
Creative	57	60	194
Inconsequential	22	25	264
Superficial	32	34	245
Valuable	90	96	125
Scholarly	55	59	197
Worthless	6	14	291
Rigorous	28	32	251
Interesting	77	78	156
Important	62	59	121
Scientific	71	63	177

Note: None of the chi-squares for the difference between Ed. D and Ph. D responses was significant at the .10 level.

Summary: The entire section on differences between Ed. D and Ph. D candidates responses to the Graduate Student questionnaire may be summarized by pointing out that random sampling variations alone could easily account for all of the significant differences observed. There may have been a slight tendency for Ph. D candidates to have a more positive attitude toward research, but this difference was not significant.

C. Bivariate Distributions

Bivariate frequency distributions designed to compare response on each item with that on each of all the other items were prepared. With the 67 items this meant $\frac{67}{2}$ (66) or 2211 tables. These were done by the CDC 3400-3600 configuration using our adaptation of the Yale Table Program.* This program computes the chi-square value for each table as well as tabulating the joint frequency distribution.

The Variables that were interrelated may be observed on the Graduate Student Questionnaire coding sheets given in Appendix H. The list of tables whose chi-square values were significant, and the level of significance are also given in appendix H.

Results This section also may be summarized by noting that random sampling variations alone could easily account for the significant difference observed.

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*Yale Table Program. Yale University Computing Center, 62 New Haven Street.

CHAPTER IV

INTERVIEW STUDY

The interview study was designed to obtain a sample of exemplary practice in educational research. It was recognized that the questionnaire study would provide general information about a range of practice, but results of such study would almost inevitably be expressed as an average of typical practice. In order to attempt to complete another part of the picture of educational research attitudes and practices, it was deemed desirable to carry out an interview study within schools that had been selected as outstanding for their educational research.

Sample: At the time of the study there were 723 group II, 442 group III, and 193 group IV institutions, or 1,358 in the United States that granted the bachelor's degree and/or additional degrees.[1] Among the 193 schools not all offered advanced work in education.[2] The complete list of institutions that actually granted one or more degrees during the period studied is given in appendix A. From this group of schools eight were selected because they were judged to be most "productive" relative to 1) amount of research and writing, 2) estimated level of research, 3) faculty, 4) size. Selection was made partly from empirical data, but largely from judgments. Judgments were obtained from a) nominations obtained from interviews with officers of the American Educational Research Association, members of the Research Advisory Panel, and members of the Organization for Research in Education. These people independently ranked twenty schools that had been selected through initial screening by the staff of this project. Schools offering the doctorate in education were ranked relative to estimated adequacy of faculty and curriculum for the preparation of educational researchers, and estimated level of educational research produced. Empirical data, used to rank the amount of research and writing was made by counts of publications indexed by Education Index, ASTIA and the Bio-Sciences exchange. The latter is now known as the Science Information Exchange.) The number of doctorates granted in education were obtained from N.E.A. publications. (They might also have been obtained from Office of Education publications.) Overall enrollment was also used as an index because it was assumed that the larger institutions could have facilities that would not be available to smaller schools. Judges were asked not to judge solely on size in this connection, but on size as an index of capability and to use their judgment in order to eliminate schools with 'diploma mill' tendencies.

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[1] Educational Directory, Part III, Higher Education, 1957-58. Washington, D.C.: U.S. Office of Education.

[2] For example, Indiana had five schools listed in group IV, but only two of these granted advanced degrees in education. Illinois had nine schools listed in group IV, but only five of these granted advanced degrees in education; New York state had 21 listed but only seven granted advanced degrees for education.

Ranks were obtained on all criteria independently. These ranks were summed and the sums were then arranged in rank order. Using these ranks eight schools were selected as outstanding at that time. In 1960, the top eight institutions, in alphabetical rather than rank order, were:

California, Berkeley
California, Los Angeles
Chicago
Harvard
Michigan
Minnesota
Stanford
Wisconsin

About 120 people were interviewed at the schools that were visited.

Procedure: Arrangements were made to visit these schools and interview both administrative officials and faculty members designated by administrators as most active in research. It was possible to visit only seven of the eight schools.

Semi-structured interview schedules were developed and tried out on 20 people in two schools that were not included in the sample. The pilot study was used for tryout of the questions and for training the interviewer.

Copies of the questions asked may be seen in Appendix E. The administrator's schedule contained questions directed toward:

A. General items

1. What factors are considered important in the operation of an outstanding school of education?
2. How would educational research be defined? How do you decide whether a given project is or is not educational research?
3. How important is educational research for the well-being of the school?
4. What are the special skills and learnings, if any, that are required in order to do educational research?
5. What facilities are most likely to be important for doing educational research?

B. Training of educational researchers.

1. Request a catalog and/or other literature that describes requirement and courses for educational research training.

2. Are students prepared to do independent research in their major area after completing their graduate work?
3. What requirements do you regard as significant in the preparation of researchers?

C. Climate and support of educational research.

1. How important is educational research in comparison with the functions of instruction and service? (Ask what per cent of the total budget of the school is allocated to each function--teaching, service, and research. The total should equal 100.)
2. What incentives are provided for encouraging educational research? (Promotions; time off from teaching; funds for special needs; space, equipment; apparatus and instrumentation; computer facilities; library; travel to professional meetings; faculty committees to study and encourage research; a formal organization for facilitating faculty research; visits to other schools; interdisciplinary exchange of ideas and criticisms relative to research.)

D. Leave the time distribution schedule with the dean and ask that it be filled out. (See Appendix E for Time Distribution Schedule.)

E. Ask for the names of faculty members most active in doing research. Ask for indication of per cent time available for research of these people through relief from teaching and other responsibilities.

F. Prepare a schedule of interviews, call and make appointments for interviews with faculty.

The faculty schedule contained questions like the following:

1. Case history of a current or recently completed research project. (Recent means completed during the past 12 months.)

   a. Background of the study?
   b. Questions that were studied?
   c. Tools, techniques, devices, design used for collecting and analyzing data.
   d. Interpretation of results.

2. Who is doing research like yours? (Audience or group with whom you communicate?)

3. Significance of research like yours?

   a. On what basis do you decide whether a piece of research is exceptional?

4. Encouragement and support of research at your school?

   a. How important is research in comparison with teaching and service responsibility? (What per cent of time is available for each?)
   b. What incentives are provided for encouraging educational research? (Promotions; time off from teaching; funds for special needs; space; equipment; instruments; computing facilities; library; travel to professional meetings and other schools; visiting lecturers; symposia; short training courses on special topics, etc.)

5. Training for research?

   a. When is a person capable of doing research in your area?
   b. How does training that is regarded as acceptable for educational research compare with that given for research in psychology and sociology? (Course work, apprenticeship experience, selection of candidates for admission, . . .)

6. Criteria for acceptable research in your field?

7. What per cent of your time is devoted to research, teaching, and service?

Results:

A. Summary of data from deans.

1. What is being done to provide a favorable research climate?

Many things were said to be done:

a. Providing facilities and conditions that encourage research by released time from teaching for research, adequate salary, promotions, research assistance, funds for research costs, consultative services, library and other necessary materials.

b. Faculty committees that assist with mechanics of applying for grants, administering research budgets, and assisting specific research projects; faculty interaction and communication that encourage rather than restrict identification and development of research upon significant problems.

c. Administrative procedures that encourage the discussion of research problems and specific projects, the main channels of communication about research, the publication and critical review of research studies, the employment of a staff with research competence, and the provision of financial and social rewards for research of high quality.

d. Employing and encouraging faculty members who strive for scholarship in their respective fields, manifest genuine interest in and are productive in research, emphasize scholarship and research in their teaching, know actual problems or operations in education to which their research relates, invest their primary research effort in studies of a basic nature, constantly stress the importance of their own, their students', and their institution research, continuously and realistically appraise their own efforts and competence as well as those of others, do not undertake or direct research for which they are not competent, continuously review and appraise the procedures used in training research workers and the climate of research present on the campus.

Comment:

These are verbalized comments and are just what one would have predicted as responses to this sort of question. The fact that a dean may be fluent in giving many of these kinds of responses may not necessarily indicate that he vigorously supports such measures. The general impression was that the deans in all the institutions visited were sincerely convinced of the importance of educational research and actively attempted to do something about it. In fact, because of the selection procedures used, any other pattern of response would have been most surprising.

However, the impression persists that even in these selected institutions there were wide individual variations in the extent and direction of administrative activity in support of educational research, but no attempt was made to quantify this impression. Some deans were content to pay verbal homage to the encouragement and support of research and then get on either with their own research or with other tasks that are required of administrators.

The role of a dean actively promoting favorable public attitudes toward research was manifested by only one dean. This dean organized a Citizens' Conference in Educational Research where influential citizens and public officials participated-governor of the state, members of the legislature, the leaders of the various professional educational organizations. The need for financial support of educational research was vigorously promoted. This dean has also been a vigorous spokesman for educational research in his public appearances. His success in obtaining financial support for educational research should be of interest to those who complain about public apathy in the support of educational research.

So long as educational research is dependent upon the public for its support, it would be encouraging to see more effort directed toward informing that public as to the significance and importance of educational research. Perhaps this may seem to be beneath the dignity of some administrators but it is an essential function so long as we live in a republic.

Perhaps a digression into the support of educational research as compared to other research may be useful at this point. Business and industry, according to the vice president of Arthur D. Little, Inc., invests at least five per cent of its budget in research. Education spends less than five one hundreths of one per cent.

Governmental expenditures for research[3] are indicated, in millions of dollars as follows:

Table 81. Expenditures for Research

	1950	1955	1960 (Estimated)
Research and development national security	871	1804	4572
Other	209	281	912

The Office of Education Cooperative Research Program budget for fiscal 1960 is about 3.2 million or about .03 per cent of the "other" research and development item. Budgets of state and city school systems for educational research are usually established at a much lower rate than this.

Discussions[4] about educational research claim that potentially

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[3] Committee on Economic Development, The Budget and Economic Growth, New York, 22, 1959

[4] Dean L. J. Stiles, University of Wisconsin, July, 1958.

> It can test theory explicitly before costly expenditures are made for programs. It can take the practice out of trial and error. It can show how to produce a better product, more efficiently and with greater economy. Yes, educational research, like research in other fields, can save money: it can increase the educational returns on our investments for schools. Sound educational research is desperately needed in these times to help produce better teachers, better schools, and better citizens. Investments in educational research undergird our national security and contribute to continued freedom of our people.

When one examines the budgets for educational research in relation to the needs for it, one is disappointed to say the least.

2. How are the budget funds distributed among the functions of instruction, extension and public service, and research?

Only five institutions gave usable data with reference to this question. These were distributed as follows:

Table 82. Distribution of Time Among Faculty Responsibilities

	Institutions				
	A	B	C	D	E
Instruction	76.5	76.3	71.3	63.5	51.0
Extension and public service	2.6	3.2	3.2	7.6	16.4
Research	20.9	20.5	25.5	28.9	32.6

The reader is warned that comparisons between institutions are hazardous because the items included under each heading are not necessarily equivalent. The point that is clear, however, is that in the selected schools research receives a larger share of the budget than extension and public service. In schools not so well known for their research activity, this relationship is usually revised.[5]

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[5] A Restudy of the Needs of California in Higher Education. California State Department of Education, Sacraments, 1955. Also, the California Big Ten Cost Study.

Also: H. G. Badger and M. C. Rice, "Statistics of Higher Education: Receipts, Expenditures and Property, 1951-52," Bi-

3. Assignment of faculty time for research.

It was thought that a better perspective might be obtained by obtaining time distribution data on all of the faculty.

Table 83. Time Assigned for Research Distributed by Faculty Rank

	0%	1-24%	25-49%	50-74%	75-99%	100%	Total
Professors	21	7	7	3	5	2	45
Assoc. Prof.	10	4	5	1	2	1	23
Asst. Prof.	14	3	2	2	1	3	25
Instructors	7	0	0	0	0	0	7
Lecturers	1	0	0	3	1	0	5
Associates	2	0	1	0	2	3	8
Assistants	66	1	4	27	0	5	103
No rank	2	0	1	0	0	0	3
	123	15	20	36	11	14	219

	Under 25%	25-49%	50-74%	75-99%	100%	Total
Professors	27	5	1	0	2	35
Assoc. Prof.	21	0	0.	0	0	21
Asst. Prof.	22	0	1	0	0	23
Instructors	53	0	0	0	0	53
Lecturers	3	0	0	0	0	3
Associates	1	1	1	0	3	6
Assistants	0	12	10	0	0	22
No rank	0	0	1	0	0	1
	127	18	14	0	5	164

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ennial Survey of Education in the U.S., USOE, 1955. Of all the money available for research, 82 per cent was expended by universities, 14 per cent by technical schools, 3 per cent by liberal arts colleges, and 1 per cent by professional schools. Colleges commonly known as teachers' colleges, whose primary function is the preparation of elementary and secondary teachers spent $85,700 for research, or less than .03 of one per cent of the total research expenditures in higher education.

These data were collected under the assumption that schools which valued research most would make such provision in the allocation of faculty time for research. This may be a valid assumption in some schools, but it is unwarranted in other schools. To make these data comparable one must make sure that the teaching load is essentially the same between institutions, i.e., a professor teaching seven hours would be listed in the zero column if the basic load was seven hours at his institution, and would be listed as having been assigned 50 per cent time off for research where the teaching load was fourteen hours. There are also such considerations as how demanding are the preparations for teaching, and what are the standards of classroom lecturing at the institution that must be taken into consideration. Among the universities visited, only the two distributions given above were regarded as sufficiently comparable to warrant presenting the data.

The data indicate that even in the institutions selected because of their research activities, most of the faculty members are officially assigned little or no time for research.

4. List of faculty publication.

Listings of faculty publications indicate that many of the publications are not research. They are usually editorials, book reviews, textbooks or narrations about a point of view. The range of publications within an institution that might be called research runs between one-fifth and two-thirds, and this is irrespective of the level of the research published. Comment on Dean's Questions:

It was originally thought that the interview might be used as a means of data collecting, and the interview schedule was designed to obtain data that were relevant to the importance that the institution attached to research as a faculty activity. Actual experience in doing the interviews suggests that this is essentially an exploratory activity that does not yield comparable data. However, it does provide suggestions as to the variations found among schools, and the need for reaching a common denominator before the data can be said to be reasonably comparable. In other words, these data reflect within-institutional characteristics; it is hazardous to regard them as reflecting between-institutional practices except to a gross and unknown degree.

Summary of Data from Faculty:

Individual faculty members were asked two sets of questions. The first set dealt with a case history of a current or a recently completed research project. This included (a) the background of the problem--what did it grow out of, its conceptual context or frame of reference; (b) specific questions currently being studied-deductions from the frame of reference, hypotheses being studied; (c) tools, techniques, devices, designs, tests, or methods used in collecting data, and nature of data collected; (d) analyses of data; (e) interpretation of findings in relation to frame of reference, new concepts, new hypotheses, questions, suggestions for new data, tools, techniques, instruments, devices, methods of procedure and analysis; (f) publications.

This block of questions was designed to identify the strategy and tactics used in educational research, and the likelihood that these would lead to cumulative development of systematic knowledge. A summary of this section is impossible within the time and space available. The impression of the author is that these case histories show a much more substantial basis for accumulation of knowledge than is usually evident in published research.

The second set of questions dealt with the faculty member's ideas on the question what is educational research? What criteria or standards does he use for distinguishing good from mediocre or poor educational research? What is adequate preparation of educational research workers-selection, course requirements, and research training experience? What aspects or developments in his field of interest appear to be most worthy for future development, or what trends seem to deserve support and emphasis in the future?

What is educational research?

"Educational research encompasses almost every sort of activity from the use of reference books by elementary school pupils to the most rigorous and systematic experimentation by research personnel."

"...Educational research is the activity that is directed toward the development of an organized body of knowledge about events with which educators are concerned. A scientific body of knowledge should enable the educator to determine just what teaching and other learning conditions to provide in order to produce desirable aspects of learned behavior among those who attend school. Learning conditions will have to be suited to the aptitudes and other characteristics of the learner."

' The kinds of problems dealt with by educational research include-development research, curriculum research, research related to sociological and economic conditions affecting education, institutional research, administrative research."

"Educational research has ceased to exist. A large number of people are doing small studies, essentially amateur jobs that are not expected to influence anybody. Their value may lie in relation to [the individual's] teaching."

"The educational research spectrum includes:
a. Fundamental research that could be equally well done in one of the academic fields or behavioral sciences. The reward structure of universities is such that it gets you more than other types, and tends to crowd out applied research. Conclusions of this research should be relevant to educational method.'

b. Work on educational principles, i.e., Brownell's work done in a classroom with classroom materials.

c. Developmental research designed to produce instructional materials in a form to be used in the classroom-the Illinois and Yale math projects and the MIT physics project.'

d. Operational research or activity associated with the operation of an enterprise-selection test for candidates to veterinary college, surveys, etc. where no attempt is made to generalize.

' There is too little evidence gathering on all sides."

"In education we need to look at the academic fields. The social wisdom of having all educational research done by educational researchers is questionable. People who want to do theoretical or long continued research are better off in an academic field like psychology in terms of stimulation, where they can go as deeply as they want . . . One must constantly balance a scholarly career against getting something done in education."

What do we seek out of educational research? . . .

a. We seek to clarify as best as we can the task that lies before us as educators. What are we trying to do? This turns out to be an unusually stubborn and difficult question despite all the wrestling with it by educational policies commissions and others. Are we trying chiefly to sharpen the tools whereby our pupils can play their respective roles in life? Or are we going beyond this to make them enlarge their vision as to what their roles might be? How we answer these first questions determines how we answer the second group.

b. We try to discover how best we can achieve the ends we seek within the limitations imposed upon us by our communities, by the children who come to us, by those of us who teach. I wish to stress that because of these limitations education is an applied science and does not go on in a vacuum.

We can do some kinds of research by impoverishing the situation. Thus we can study eye movements in reading by fitting the head into a frame and limiting the material which can be read . . . so as to interfere as little as possible with photographing eye movements. Such experiments are good science, but my impression is that they have not served education very well because of their very impoverishment. They can tell us nothing about such important aspects of reading as how the child selects a book from the library . . . The literal level of educational re= search is represented by rather plain and matter-of-fact studies of educational attainment, say the collection of norms on tests . . . This, too, is useful but it has lacked something that we need.

The enriched level of educational research requires that we study what is happening in school and community in some total fashion. Skill learning in the school may depend on the aspirations of different socio-economic classes, on the extent to which teachers understand these differences, as well as on teaching materials and methods.

Educational research is conceived to include all forms of scholarly work aimed at discovering new knowledge at or making creative interpretations, organizations, or applications of this knowledge. It may involve experiments in the laboratory, clinic, or classroom, requiring considerable apparatus and equipment; it may be abstract and theoretical, demanding few facilities beyond paper and pencil.'

Comment: Educational research is different things to different people. The boundaries are those of the school or educational situation. Educational research appears to be willing to assume responsibility for all phases of scholarly activity associated with the educative process.

It thus includes:

a. Carefully designed experimental studies that provide a critical test of current or proposed practices. Other types of studies, including surveys, may also contribute usefully when new approaches or techniques are used, but mass collections of data, not illumined by some guiding ideas, should be discouraged.

b. Contributions of a theoretical, historical philosophical, or integrative type as scholarly activities. Conceptualizations of areas of research, to provide a general rationale or framework for studies that encourage a wise utilization of research effort.

c. Critical reviews of research literature and summaries of issues and problems.

d. Applied research, focused on local practices and policies, that is planned to stimulate interest in more fundamental studies, as well as to develop the school staff and illumine some immediate problem. This activity would be directed toward becoming operations or logistics research. The writing of textbooks, preparation of instructional materials, and administration of a school seem to be relevant activities when impelled by more basic considerations than those of the immediate situation.

Educational research seems to have rather fluid boundaries. One is forced to the banal operational definition that educational research appears to be what educational researchers do.

The activities of researchers interviewed in the pilot study exhibit a different picture from that reported by Ryans[8] as typical in the activities of research offices. It is activity of these rather than the typical researcher, than the definition might stress.

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[8] D. G. Ryans, Journal of Educational Research, 49:195-202, 1955 and Elementary School Journal, 58:9-15, 1957, Journal of Educational Research, 51:173-184, 1957.. In the latter study the activities of research offices are summarized under:

a. services and accounting-pupil record keeping, preparation of budgets, preparation of salary schedules;
b. supervisory activities-conduct of curriculum planning, guidance services;
c. conduct of public relations;
d. demonstrations;
e. action research;
f. school surveys-community survey for a new school building, testing survey, financial survey;
g. correlational studies-prediction studies;
h. educational rationalization-searching for and retaining only evidence in favor of a current practice;
i. experimental studies-ranging in sophistication from the relatively naive to the sophisticated.

Discussions Relative to a "Good" Study

A good study puts us ahead of where we are now, tackles problems not handled by peers, solves problems that others have failed to solve. A good study makes a difference in educational practice, if the potential applications are taken seriously. A good study is imaginative, ingenious and productive of new approaches, new ideas and new data. A good study fits into a pattern of long range work. It has antecedents and consequents, and the total result is increased understanding of a field as a result of the accumulation of studies.

A good study is carefully designed and planned. It identifies a definite problem. All parts of the procedure are relevant to the question being studied-data collected, analysis of data. The interpretation of findings or meaning of results is directly related to the organization of the study and the procedures used. The results are also directly related to the conceptualization used, and may suggest new data and new concepts.

A good study is aimed at discovering truth, not at supporting a current or proposed practice. It deals with more general and universal aspects of questions that concern education. The goal is not to find a quick solution but to develop tested principles. Results of a good study can be communicated to peers working in the same area.

A good study is appropriate to the level of development of its field and to the questions asked. Education is an enormous public enterprise engaged in a form of mass production. It is impossible to operate on this scale without systematic quality control, for without quality control we don't know where we stand, and we cannot correct the weak spots. A program of quality control involves systematic and continuous collection of facts on pupils including long term follow-up of graduates. Data would include tests but would also include data on motivation, socio-economic background, level of aspiration, emotionality, etc. Operations research tells the school about its raw material and about its output. Operations research and quality control methods could be applied to operational data.

Poor studies consider an unimportant problem, are improperly designed, are over-generalized, or improperly done. They include trivial studies or those that have been done so often, that there is no use doing them again-correlations between ACE, high school ranks, etc., and college grades.

In educational research the objection to a study is not that the data are not as precise as laboratory experiments, because one recognizes that education data have a high variability built into them. The objection is that such studies are often ex post facto; i.e., ' what happens to high ability youth?"

A poor study doesn't account for enough of the variance, has an insufficient number of independent variables, or permits little identification of variations. Such studies are often repetitious and naive, often definitely clerical in level of manipulations.

Clear percise studies of learning under various treatments appeal to natural scientists. But many studies lack a central problem, or have no theoretical formulation and no comprehension of why they might be important.

Many education studies are trivial or axiomatic. Investigators often just pick up variables that happen to be around, precise identification of dependent and independent variables is lacking, and they often miss variables entirely or fail to name them.

Poor studies are illustrated by some of those in the productivity of groups. One gets a correlation of .70; one can choose any variables and still get the same correlation. The basic failure is in not understanding of what the relevant variables are.

Comment: Distinguishing between good and poor research on an overall basis is difficult to accomplish and to communicate. Since the quality of studies differ in many characteristics rather than on an all-or-none basis, general distinctions properly lead to substantial differences of opinion. Within his own frame of reference, a researcher can readily make distinctions between good and poor studies. Difficulty arises when he attempts to communicate these distinctions to others. The case histories of research projects given by the interviewees appear to exhibit sufficient similarity in level of scholarship, persistence, conformity to criteria of intellectual integrity, knowledge of the field, command of research techniques, tools, and methodology, etc., to warrant an attempt at communication. To succeed would require that the distinctions be reduced to some definite bases. A set of evaluative criteria could be developed and each illustrated by specific examples. These materials could be submitted to a jury of peers for appraisal. Resulting data could determine feasibility of the attempt. If the data exhibited desirable characteristics, further study using a scaling technique might be pursued. Such an effort would be useful during the training. of research workers or inconjunction with their training.

Editors of journals and other professional publications and administrators of research grants might also find these criteria useful. However, competently trained researchers could probably spend their time to better advantage pursuing their own research rather than evaluating that of others.

What is adequate preparation for educational research? (Selection, courses, and research experiences)

Selection: Traditional criteria for selection such as high intelligence, and a high undergraduate record alone do not provide a desirably accurate or comprehensive base. Other predictors that should be investigated include originality, creativity and imagination, curiosity and enjoyment of intellectual exploration, independence of investigation and thought, persistence in carrying on projects to completion. Motivation toward research is very important and should be considered.

Courses: Comments favored the following: The program of training research workers should take account of the students' abilities and interests, and the institution's faculty and other resources. There might be some combinations of the following components in course offerings: a set of service courses wherein the faculty discusses its conception of the theory and practice of education, the body of knowledge in education and from the behavioral sciences bearing on the areas of concentration, the research techniques and procedures used in this field; a series of seminars where professors describe their research projects and where participants actively appraise and criticize; a series of opportunities for students to formulate and test their own research approaches. The emphasis appears to be put not so much on courses as upon capability of the faculty, institutional climate and resources for research.

Several interviewees doubted that the greater the student's mastery of statistical and other tools the more effective he would be in research, or that the greater his scholarly knowledge of the field, the more likely he would be to contribute to that knowledge. They also doubted that the value of theory increased as it became more formulized and detailed. The importance of these elements was not belittled. "Statistical competence, scholarship, and theoretical sophistication are all important in research. The point is that each of these should be means toward the end of contribution to knowledge, not ends in themselves. The danger is that the individual will become so enamoured of statistical techniques that they largely determine his research decisions, . . . The danger is also that so much time will be spent in mastery of these means that too little time will be left for other experience crucial to the development of a creative researcher. Competence in tool subjects or skills such as mathematics, foreign languages, electronics, physiology, etc., should be required of individuals where and as needed, but required in depth rather than as across the board hurdles that all must meet.'

Others indicated that "education is not set up to train educational research workers. If one is training for research, he needs to have the student in a research atmosphere. Research people come in bunches like grapes. In schools of education, a research person is unhappy-he needs facilities, library, assistants, equipment. The student is put into a curriculum and experiences isolated from research contact, loaded up with course work." Still others indicated that graduate training in education is directed toward a professional goal usually teaching or administration. Research is often only a peripheral activity. There is no graduate school that specifically prepares professional educational research workers.

Another suggests that ' successful educational research does not reflect any particular training. Select twenty-five people doing educational research, find their career route and you will note that background of training makes little difference. The problem is one of recruitment and seduction of competent people, rather than of the training program. Study the jobs-what are the roles in which educational research has gotten performed--Cronbach, Tyler, Brownell, Neal Gross. The job role is more significant than training when you have outstanding people.

Research experience in training: No dissents were observed with respect to the importance of research experience during training. Most people assigned this phase primary importance. Some cautioned that the significance of this experience depended on the nature of the faculty, their interests and productivity, upon student interest, and upon student-faculty compatibility.

Education for research must do more than develop competence in designing, executing and interpreting studies. Developing such competence is important, but much more so is the development of the individual's creativeness-his ability to discover new relations, to reformulate or systematize known facts, to devise new techniques and new approaches to problems."

For the teacher or administrator "one can specify a range of problems with which he will have to deal and the substantive knowledge, methods, and techniques likely to be relevant. Standardization of preparation for such jobs has much to recommend it. In contrast, research is always concerned with search for new knowledge and there are no clear-cut rules for finding it . . . It is our belief that the education of the research student must be largely in terms of the interests and aptitudes of the individual.

In training for research we should be interested in developing researchers who know how to do research and who continue to do so. One is most likely to sustain a productive research career if he has found research satisfying.

The task of the researcher is not mainly that of designing a study, collecting data, analyzing results, or drawing conclusions. . . . this is not what makes the difference between run-of-the-mill and significant work.' Confirmatory activities constitute but a small part of the process of active research, and mostly in the terminal phase.

' Creative activities are often informal, sometimes illogical and far from neat looking. They include a great deal of floundering, pilot studies, exploratory research. Numerous leads and ideas are developed. Most of these are rejected outright, some are followed up. . . . If an idea followed happens to be poor, a lot of time is wasted. If it happens to be good, the researcher may make a positive contribution. Between the idea and the contribution lies a lot of originality, intuition, persistence, and hard work. It is this sort of activity that comes first in time, or there is little worth processing by the confirmatory activities. The job is rarely finished by doing an experiment and finding significant differences. Making a contribution is a process of continuous work during which ideas change and develop.'

The following comment provides a summary to the matter of training for research:

> ' Central to education for research is a faculty which itself is actually doing research. With such a faculty formal course works can usefully supplement the development of researchers through the internship. In the absence of such a faculty and thus the absence of meaningful internship, preoccupation with the improvement of courses offered or of various formal requirements can contribute little to what is crucial to research training.'

Concluding statement: Data reported here are inherently incomplete in terms of giving a picture of the current status of educational research. This was recognized in the original plan. Phase II of the project will attempt to get comparable data from all institutions that grant a doctorate in education. The pilot study was done to obtain an idea of points that might be significant within the domain of educational research, and to explore feasible means of obtaining comparable data.

Outstanding institutions were selected in order to observe the state of the practice at its best. The complacency observed was disturbing. To be sure there were many examples of capable and dedicated workers. However, the nondiscriminating kinds of activities currently carried on under the name of educational research tends to bury these with the mediocre.

The physical, biological, medical, and agricultural sciences have recognized that their effectiveness is based on a constant harvest of new knowledge. Innovations are systematically developed from an ever increasing body of knowledge and rigorously tested for effectiveness. Contrast this with the usual practice in education. The plain fact is that the formula of innovation by accidental discovery or improvisation is completely antiquated.

Historically, the older sciences began and were supported for centuries by the work of amateurs. Their significant period of growth, however, began only when the amateur ceased to play the major role. Adding to the basic fund of knowledge in education is rapidly approaching the stage where casual part time effort is not enough. Education will begin to approach its proper level of efficiency only when we recognize that the problems of effectiveness are scientific and technical, not political. Only by inspired, sustained and systematic research in education similar to that which has graced the older sciences can education become truly effective.

Summary of factors affecting educational research in selected universities as revealed by the interview study.

Facilities

Climate: Perhaps the most important facility is the somewhat intangible one of a favorable research climate. This is not a single item but the intersection of many activities, interests and specialties. It is an attitude that represents a value system where intellectual independence and effort is valued, encouraged and supported. People not only are actively doing research, but there is also a built in expectation of achievement. (Some institutions seem to be filled with researchers who are constantly busy but never getting anything done.) Favorable climate provides the opportunity for inquiry, and it also contains the responsibility for achieving something more than the research activity.

Finances: Funds are allocated for research, by the institution from its operating budget. All research funds do not come from the federal government, foundations, business and industry, or some other outside source. These funds include provision for study and travel, for bringing outstanding people to the campus, etc., as well as for purchase of the hardware and clerical help.

Library: Adequate in current professional journals, government, business and professional publications of use to researchers. Number of volumes in the library, or size of library building, etc., are not as significant for research.

Equipment: Computer facilities alone are no index of usefulness. Availability and actual use of these, however, appear to be. This includes such items as: "open vs. closed shop," availability of courses and training in machine utilization, programming, and data processing, seminars in numerical analysis and related topics; adequate statistical laboratory including desk calculators; courses in sampling, mathematical statistics, multivariate analysis, mathematicians and their facilities; facilities for instrumentation and availability of expert assistance and guidance in constructing apparatus.

Organization: An organization for research is essential. Someone is needed to do the housekeeping necessary to provide the resources, facilities, space, personnel, instrumentation, etc., necessary to do research efficiently. To be a respectable researcher one no longer figuratively needs "to cure his own bacon or do his own cooking." Institutions with organized research appear to be more productive than those that use a strictly laissez-faire arrangement. Research administrator should be a qualified and respected researcher first and foremost, and only then an administrator. Note that "organization" comes at the bottom of the list of facilities. Unless the other, more important, factors are present, organization is useless. The organization ought to fit the circumstances. An institution just starting on a vigorous program for research may find that the organization must be more directive and active than one in an institution with a long established tradition of research.

Course offerings: Catalog study revealed little difference in course offerings between outstanding institutions and a sample of others. Course titles and descriptions seemed to be a sort of public property. All institutions were in favor of research and scholarship, all claimed to have high academic standards of achievement, all expressed confidence in their faculties, etc., if one were to take catalogs at their face value.

The number of research-oriented, as opposed to practice-oriented courses seemed relevant. Thus, some institutions offered several courses in statistical and research methodology, others offered but one-a beginning statistics course or one in research methodology.

A significant difference among institutions was found in the number of offerings in related departments outside of education-behavioral sciences, mathematics, statistics, philosophy-especially the philosophy of science; physical sciences, life sciences, and engineering technology appear relevant in certain institutions. In other words, we could not distinguish very well among institutions, assuming that the original identification was reasonably valid, when the offerings in education alone were examined. However, we thought we could distinguish sharply among institutions when the entire bill of offerings was examined. No investigation has yet been made of the extent to which students availed themselves of these offerings.

Administration: Some evidence of understanding research appeared relevant. Questions asked contained essentially the same items as those indicated for faculty. Deans who had a record of supporting research appeared to have: done some publishing of their own studies (these involved something more than summaries of enumerative or normative data or ex-cathedra pronouncements); attended research meetings; indicated that time for doing research was made available to faculty through reduced teaching load, financial assistance for purchase of equipment, supplies, travel, clerical and computing help, etc.; when decisions are made on allocation of budget funds, research was not overlooked because other demands were so pressing or urgent.

Promotion policy and salary increments seemed to bear a meaningful relationship to research productivity and activity among faculty. There were not several "unexplainable" individuals of professional rank-i.e., for "meritorious public service," "public relations and visibility," etc.

History of recognition of scholarship and research was an important function of the institution. This was constantly reflected in public utterances and in dealing with the institution's patrons, in the allocation of time, resources, space, budget; in the administrative organizations of research where the persons concerned spoke to the man in charge not to the fifth receptionist; knowledge by the dean of what research his staff was doing, who were his most productive researchers; was able to keep his best researchers despite offers from other institutions, etc.

Students:

Interest: Evidence of intellectual interests, as opposed to sociability, etc. See October, 1960, Review of Educational Research, "Higher Education." Evidence of curiosity and independence in intellectual habits. Evidence of experience in study or original investigation. Evidence of intellectual habits resembling those of disciplined inquiry. Bad name for discipline, "mental discipline" as a result of misinterpretation of Thorndike's studies. Thorndike effectively dealt with ridiculous claims of "strengthening the mind," but ways of working, strategies and tactics, expectations were neglected. The skilled mathematician, astronomer, historian, school administrator has ways of working that are the basis of his claim to professional competence. These contain a built in expectation of achievement that can be exposed to rigors of criticism and appraisal by colleagues. Product and process can stand rigorous public inspection by ones peers.

School record: Outstandingly good grades should be a reason for suspicion, i.e., grades should probably be good but not so good as to suggest slavishness, academic grind.

Test scores: Like grades, good but not necessarily outstanding, except on the topic of their special interest-then scores should be phenomenal for best risks.

Age and Experience: In both instances probably a little goes a long way. Too much of either should lead to further questions. Experience is evidence closely related to interest. Those with lots of both age and experience should consider becoming practitioners rather than researchers.

Previous achievements: Good risks usually can point to some dramatic achievements-patents, exhibits, original studies, papers, experiments, instrumentation, and apparatus.

Faculty: (Note: Not all faculty will, or should, be doing research. This should not be confused with application of tenants of disciplined scholarship and inquiry within their teaching. Those who know literature best are not most productive researchers. Paul T's comment on going back in the literature to early sources is relevant. Problem-solving studies are useful here.)

Interests: Actively interested in research-read current materials on their field of specialization; belong to professional organizations, subscribe to professional journals; conduct seminars or colloquia where current research is discussed, criticize and restructure to improve it; attend professional meetings of research groups; present papers or participate in research group meetings; collect data, restructure problems, examine studies in terms of alternative explorations that he thinks of; has a history of continuing interest in research; continuing interest in research plus evidence of focussed effort or specialization; interest plus specialization plus evidence of continuing maturity in the subject matter or in the strategy and tactics of research (study during leave or sabbatical, research fellowship, membership in an S. S. R. C. seminar or similar group, study at an Institute (Behavioral Sciences, Advanced Study, ...). (These items seem to have an empirical quantitative bias, and some leaning in history, philosophy can also fit this structure of intellectual curiosity, activity, originality, and achievement.)

Training: No evidence that one type is necessarily better than another. Even in mathematics some individuals have developed outstanding skill with little or no formal course work. Data here are hard to obtain without examining a faculty member's transcript and I haven't been able to generate any personal enthusiasm for this task. Personally, a as a personal bias I would prefer a faculty member who had his degrees in one of the academic areas-preferably one of the physical sciences, mathematics, or philosophy for quantitative research. For other scholarly work appropriate work in the subject matter at an advanced level, would be essential. While training is not necessarily crucial, it is difficult to show positive relationship between years of "practical" experiences and research achievement or interest. One who had spent more than four or five years on a job would seem to be a poor risk for a productive research career.

Field of activity seems to be irrelevant. Research activity seems to be appropriate to almost all aspects of education.

Activity: In addition to activity indicated under "Interests" this includes actively speaking up for research as evidence of a deep commitment to it. Why Behavioral Scientists can't do educational research! Commitment is to their subject material.

Criteria of Research Productivity:

1. Publications that are recognized by colleagues as being something more than routine or matter of fact. Other things being equal number of publications would seem to be a good criterion. However, the merit of ideas does not necessarily reside in the number of pages that it takes to tell about them. Sometimes number of times a paper is quoted or cited by

other writers is considered an appropriate index. Fruitfulness or logical fertility of a paper may be indicated by the number of studies it stimulates, but this is in part a function of time.

2. Criteria of intellectual maturity are very difficult to apply, i.e., they have not been delineated so as to obtain universal agreement among researchers. Generally, level of theory development, clarity of concept delineation, clarity of problem definition, uniqueness of identification of variable, appropriateness and elegance of strategy and tactics of study and data collection, relevance of data analysis, and discussion to the frame of reference or theory, etc. Above all the fruitfulness of the study in suggesting new data, new perceptions, new formulations, new problems, etc. is a paramount criterion. It provides an index of the extent to which the results of study produce cumulative increments in knowledge. Necessary, but not quite as significant, are the criteria of communicability and independent verification of results.

Pseudo-criteria include (1) statistical analyses, particularly certain multivariate procedures, which require large masses of data processing, but which lead nowhere-they neither add to our store of reliable knowledge or to the means for producing such knowledge; (2) theories that are statements of assumptions, hypotheses, or premises, deductions, etc., that bear little coherent structural interrelationship to each other or to organized knowledge already available; (3) abstruse mathematical and/or philosophical criteria that advance neither the state of organized knowledge or the strategies and tactics for the accumulation thereof, (4) statistical, philosophical, or subject matter irrelevancies that are perhaps interesting, but represent fairly well-established cul-de-sacs.

3. In general the appraisal by competent colleagues appears the best among the several but not very definitive alternatives. Like the criterion of pupil gain, it is difficult to establish connections between performance rating and certain operational or instrumental activities. This is a negative sort of criterion. It may reject obviously poor studies, but it rarely serves to distinguish among the good and the outstandingly good.

CHAPTER V

PUBLICATIONS BY INSTITUTIONS

The preceding chapter indicated that many of the activities of the faculty that result in publications are not necessarily classifiable as research in the sense that this term is used in behavioral science areas related to education such as psychology and sociology. Selection even in its broadest terms would restrict inclusion to a conceptual and for empirical orientation. Several possible sources for tabulation and publications were available including the Education Index, the list of publications obtained in the interview study, and scanning of each page of the various journals. Education Index was tried and found wanting. One could not tell from the title alone if the publication dealt empirically with a problem. The list of faculty publications did not satisfy; returns were obtained from only five of the schools studied, and the list included many publications that were not empirically or conceptually oriented. Scanning each page of the selected journals appeared to offer the most dependable strategy for deriving a list of relevant publications.

Journals To Be Tabulated:

Journals to be tabulated were:

Journal of Educational Psychology
Journal of Educational Research
Educational and Psychological Measurement
Journal of Experimental Education
Journal of Educational Sociology
Journal of Genetic Psychology
Phi Delta Kappan
The English Journal
Educational Administration and Supervision
The School Review
Journal of Teacher Education
Child Development
Harvard Educational Review
California Journal of Secondary Education
Elementary School Journal
School and Society
Educational Leadership
Mathematics Teacher
School Scientist
Journal of Abnormal and Social Psychology

This list of Journals is far from being exhaustive, and it was not meant to be. These journals were most readily available, and they appeared to be representative of the literature of educational research. A staff member was assigned the task of tabulating the articles. A large bivariate chart listing the school affiliation of the author(s) (multiple authorship was much rarer during the period 1953-57 than it is now) on one dimension and the list of journals on the other, was prepared in blank form. The reviewer began with the 1953 volume of a particular journal, scanned each article to note if it qualified as an empirical (or conceptual) inquiry, and if so, he made a tally in the appropriate cell. Each of the five volumes of each journal was tabulated. Final tables represent a tabulation of the 100 bound volumes of 20 journals during the period 1953-57.

Later a card file of journal publications was prepared. A 3 x 5 card was used to record the name of the author(s), the institutional affiliation(s), title of the article, the journal, date, volume and pages designation for each article. This card was to be used for analyzing the content according to some criteria of scientific maturity such as those proposed by Wolfle. *

1. "To what extent have first-hand observations which lead to testable hypotheses been made?"
2. "What is the stage of theory development?" (non-existent; vague; specific, such as that and identical elements in transfer; quantitative rational, such as certain theories of vision or of learning.
3. "Are the problems that have been formulated, as well as the theories, stated in scientific terms?" The problem must represent a replicable situations; variables must be clearly defined and their interrelationship clearly indicated.
4. "Do formulated concepts, theories and problems cover the area?" The theoretical or conceptual organization of an area helps answer this question--e.g., identification of gaps in known series of chemical elements as indicated by Mendelyeer's periodic table.

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*Wolfle, Dael et al "Standards for Appraising Psychological Research" American Psychologist 4:320-328, August 1949.

See also: Marquis, Don "Research Planning at the Frontiers of Science" American Psychologist 3:430-438, October 1948.

Gregg, Alan "A Critique of Medical Research" Scientific Monthly 58:365-72, May 1944.

Gregg, Alan "The Profession of Psychology As Seen By a Doctor of Medicine," American Psychologist 3:397-401, September 1948.

Dr. Vidya Bhushan was assigned the task of exploring whether or not The General Inquirer Program developed at Harvard by Stone could be used for the task of tabulating the information contained on the cards and in a brief summary of the contents. It did not turn out to be feasible.

Results: Results include a summary of publications according to frequency by institutional application of the authors and by Journals. These results are summarized in Tables 84 to 86.

Table 84 indicates the frequency of publication, over the five year period 1953-57, in twenty selected journals, by institutions granting the doctorate in education. Both number of publications and rank order are indicated for the top 52 schools. For the remaining schools only the frequency of publication is indicated. Institutions indicated in Appendix A as being part of the study that are not listed in table 84 had zero publications in these journals during this period.

It may be observed that the largest institutions had the largest number of publications.

Perhaps the two graphs, figures 5 and 6 may illustrate the relationships more readily. In figure 6 it may be observed that the top five schools have as many publications as the lowest 75 schools. The top 15 schools (roughly 15 per cent of the total) produce about 55 per cent of all publications; the remaining 85 per cent of all schools produce but 45 per cent of all publications.

About 17 institutions that granted the doctorate did not produce a single publication, in these journals, during the period 1953-57.

Figure 5. Per Cent Of Publications Produced by Various Groups Of Schools

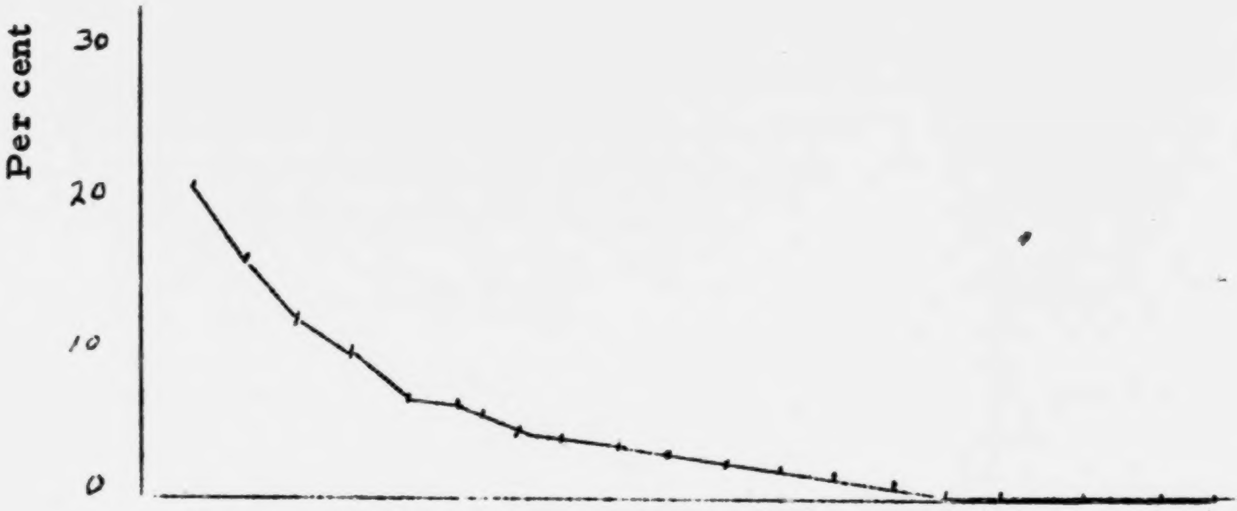

Table 84. Publications Of Institutions Granting The Doctorate In Education Over A Five-Year Period In Twenty Journals, 1953-57.

School	Number of Publications	Rank
Chicago	167	1
California (B)	159	2
Illinois	158	3
New York University	140	4
Columbia	113	5
Harvard	110	6
Minnesota	100	7
Iowa	91	8
Michigan	88	9.5
Wisconsin	88	9.5
Stanford	83	11
Texas	78	12
Ohio State	69	13
California (L.A.)	67	14
Yale	65	15
Michigan State	64	16
Northwestern	62	17.5
Indiana	62	17.5
Pittsburgh	50	19
Purdue	47	20
Florida	44	21
Wayne State	41	22
Southern California	40	23
Pennsylvania State	39	24.5
Cornell	39	24.5
Boston University	38	26
Colorado	36	27
Florida State	35	28
Nebraska	34	29
Oregon	33	30
University of Washington	30	31
Syracuse	29	32
Maryland	25	34
University of Pennsylvania	25	34
Duke	25	34

Table 84 (Continued)

School	Number of Publications	Rank
Auburn	24	36
Kansas	23	38
Peabody	23	38
Arizona	23	38
Temple	22	41.5
Oklahoma	22	41.5
Utah	22	41.5
Arizona State	22	41.5
Georgia	20	44
Buffalo	17	45
Rutgers	16	47
North Carolina	16	47
Johns Hopkins	16	47
Iowa State	14	49
Virginia	13	50
Connecticut	12	52
Washington University	12	52
Wyoming	12	52
Tennessee	11	
Kentucky	11	
Alabama	11	
Claremont	11	
Denver	11	
Houston	10	
Louisiana State	10	
Missouri	10	
Cincinnati	9	
Arkansas	8	
Washington State	7	
North Texas State	7	
Bryn Mawr	6	
Saint Louis University	6	
Mississippi	6	
Oregon State	6	
Fordham	5	
Baylor	5	
Colorado State	5	
Loyola (Ill.)	5	
George Washington	4	
Notre Dame	4	

Table 84 (Continued)

School	Number of Publications	Rank
North Dakota	3	
Catholic University	3	
South Carolina	3	
Utah State	3	
North Carolina State	2	
American University	1	
Bradley	1	
Texas Women	1	

Journal of Educational Psychology
Journal of Educational Research
Educational and Psychological Measurement
Journal of Experimental Education
Journal of Educational Sociology
Journal of Genetic Psychology
Phi Delta Kappan
The English Journal
Educational Administration and Supervision
The School Review
Journal of Teacher Education
Child Development
Harvard Educational Review
California Journal of Secondary Education
Elementary School Journal
School and Society
Educational Leadership
Mathematics Teacher
School Science and Mathematics
Journal of Abnormal and Social Psychology

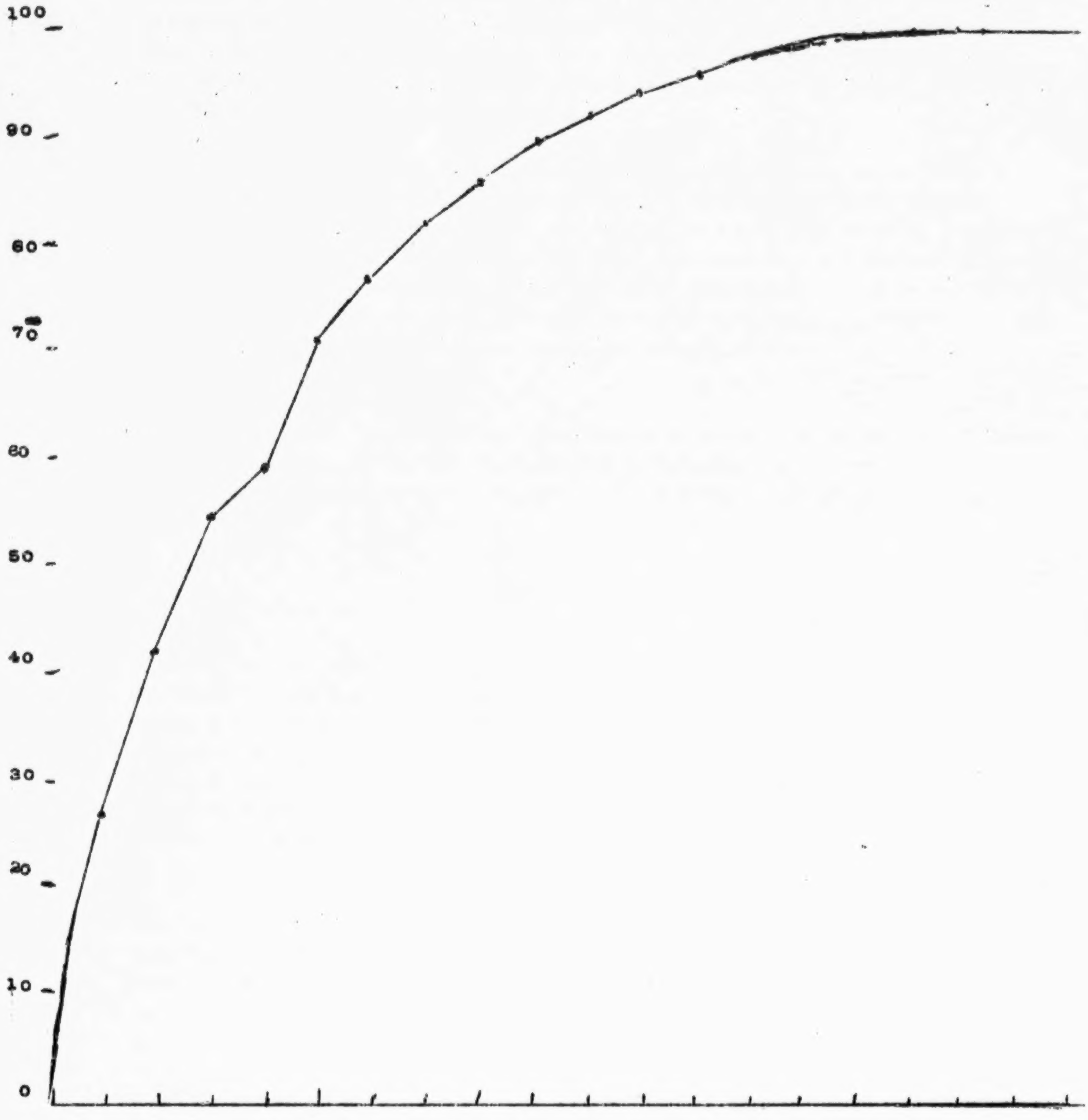

Figure 6. Cumulative Per Cent Of Publications Produced By Various Groups Of Schools.

Table 85 compares number of publications, number of doctorates granted, and enrollment of selected schools. Number enrolled per doctorate varies from 8,748 to 101. In general it may be observed that among the most productive schools the number enrolled per doctorate seems to be less than the average.

The number of publication per doctorate varies from zero to 11.9. On the whole the most productive schools tend to be slightly above average here, but not as emphatically as in the case of enrollment. The reverse of this is given in the next column--the number of doctorates per publication tends to be somewhat less among the top five institutions. The last column-number of publications per thousand enrollment seems to be greater among the most productive institutions.

Table 86 presents the frequency of empirical research publications appearing in twenty professional journals during the period, 1953-57. Frequency of publication is indicated both by school and journal.

Discussion:

Only frequency of publications by institutions and journals was tabulated. Attempts to evaluate the quality of the srticles were somewhat ambiguous and are not presented here. The attempted use of the General Inquirer Program in studying the problem did not prove fruitful. Remainder of the discussion is denoted to explication of some of our general ideas on the topic of assessment of value of scientific publications in education.

Subjective evaluations of "experts" have been the main reliance in the past in attempting to assess the merits of scientific publications, and they probably will continue to be in the future. Some attempts have been made to develop a more objective index through some type of citation count. Kuppers[1] indicates that "at present, judging the merit of a scientific publication ultimately requires a subjective evaluation." Weiss[2] in drqwing an analogy between the growth of an organism and the growth of knowledge, attempted to develop an index based on citation counts. Buchley's[3] comments on Weiss's paper that the citation count effect of a paper on research effort can be measured only years after its publication is representative of the discussion.

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[1] Kuppers, J. R. "Literature citation counting," Science 133:1138, April 1961.

[2] Weiss, P. "Knowledge: a growth process," Science 131:1716-19, June, 1960.

[3] Buckley, J. "The life of scientific publication," Science 132: 625-6, September 1960.

Table 85. Number of Publications, Number of Doctorates, Enrollment of Selected Schools

School	Number of Publications	Number of Doctorates	Enrollment	Number Enrolled per Doctorate	Number of Publications per Doctorate	Number of Doctorates per Publication	Number of Publications per Thousand Enrollment
Chicago	167	14	9006	643.3	11.9	0.08	18.5
California (B.)	159) 226	55	49057	892.0	4.1	0.24	4.6
California (L.A.)	67)						
Illinois	158	34	30796	905.8	4.6	0.22	5.1
New York University	140	104	32465	312.2	1.3	0.74	4.3
Columbia	113	233	23620	101.4	0.5	2.06	4.8
Harvard	110	38	11406	300.2	2.9	0.35	9.6
Minnesota	100	16	37904	2369.0	6.2	0.16	2.6
Iowa	91	47	11113	236.4	1.9	0.52	8.2
Michigan	88	26	27629	1062.7	3.4	0.30	3.2
Wisconsin	88	50	30028	600.6	1.8	0.57	2.9
Stanford	83	55	9277	168.7	1.5+	0.66	8.9
Texas	78	23	21655	941.5+	3.4	0.29	3.6
Ohio State University	69	52	25167	484.0	1.3	0.75	2.7
Michigan State University	64	29	24347	839.6	2.2	0.45+	2.6
Northwestern	62	15	15530	1035.3	4.1	0.24	4.0
Indiana	62	69	26791	388.3	0.9	1.11	2.3
Pittsburgh	50	24	13423	559.3	2.1	0.48	3.7
Florida	44	10	14417	1441.7	4.4	0.23	3.1
Wayne State	41	20	21352	1067.6	2.0	0.49	1.9

Table 85 (Continued)

School	Number of Publications	Number of Doctorates	Enrollment	Number Enrolled per Doctorate	Number of Publications per Doctorate	Number of Doctorates per Publication	Number of Publications per Thousand Enrollment
U. of Southern Calif.	40	60	17300	288.3	0.7	1.50	2.3
Wyoming	12	14	4451	317.9	0.9	1.17	2.70
Tennessee	11	14	17187	1227.6	0.8	1.27	0.64
Kentucky	11	12	10157	846.4	0.9	1.09	1.08
Alabama	11	8	13466	1683.2	1.4	0.73	0.82
Claremont	11	1	613	613.0	11.0	0.09	17.94
Denver	11	18	5941	330.1	0.6	1.64	1.85
Houston	10	6	11448	1908.0	1.7	0.60	0.87
Louisiana State	10	4	13918	3479.5	2.50	0.40	0.72
Missouri	10	24	15264	3479.5	0.4	0.40	0.72
Cincinnati	9	2	17496	8748.0	4.5	0.22	0.51
Arkansas	8	9	6545	727.2	0.9	1.12	1.22
Washington State U.	7	9	7311	812.3	0.8	1.29	0.96
No. Texas State College	7	5	8029	1605.8	1.4	0.71	0.87
Mississippi	6	7	5103	729.0	0.9	1.17	1.18
Colorado State	5	32	4568	142.8	0.2	6.40	1.09
George Washington	4	5	14418	2883.6	0.8	1.25	0.28
North Dakota	3	4	4423	1105.8	0.8	1.33	0.68
Utah State	3	0	7277	------	---	0.00	0.41
Bradley	1	3	4719	1573.0	0.3	3.00	0.21

Table 86

Frequency of Empirical Research Publications Published
In Twenty Professional Journals, 1953-57

(Only publications involving empirical data were tabulated.
No attempt was made to rate the "quality" of the publication.)

1. Journal of Educational Psychology
2. Journal of Educational Research
3. Educational and Psychological Measurement
4. Journal of Experimental Education
5. Journal of Educational Sociology
6. Journal of Genetic Psychology
7. Phi Delta Kappan
8. The English Journal
9. Educational Administration and Supervision
10. The School Review
11. Journal of Teacher Education
12. Child Development
13. Harvard Educational Review
14. California Journal of Secondary Education
15. Elementary School Journal
16. School and Society
17. Educational Leadership
18. Mathematics Teacher
19. School Science and Mathematics
20. Journal of Abnormal and Social Psychology

Total 5 years - 20 journals

School	Journal 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
Auburn	2	2	2	3	1		1		4		3					4	2				24
Alabama		1				1	3	2							1		1	1		1	11
American Univ.		1																			1
Arizona		1	1	2	4				1		1				2	1		2	8		23
Arizona State		1	2				2	2	6		5					2				2	22
Arkansas	1	1	1				1				1	2								1	8
Baylor			1								1	1								2	5
Boston Univ.	3	1			1		2	1	1	1	1		3		7	2		4	4	7	38
Bradley																				1	1
Bryn Mawr					1	1	1	1							1					1	6
Buffalo	1						2	1				2				1	5	1		4	17
California	12	15	14	5	2	2	6	8	7	2	7	17	3	25	3	2	1		3	25	159
U.C.L.A.	5	10	16	2	2		2			1	2	3		11		2	2	3	1	5	67
Southern Calif.		1	20	4	1		4	1	1		2	1		2		1				2	40
Catholic Univ.			1													1				1	3
Chicago	5	7	7		4	2	5	1		58	1	9	8		20	4	6	15	3	12	167
Cincinnati							1									2	1		5		9
Claremont			2		1		1			1	1			3	1		1				11
Colorado	1	2	3			2	5					5		1			1	3		13	36
Colorado State	1						2									2					5
Columbia	7	2	1	1	7	1	4	1		55	4	5	6	4	1	10	25	10	7	12	113
Connecticut						3		2	1			1		1		1				3	12
Cornell	4	5	2	3	2	1	1				2	6	2			1		1		9	39
Denver	1					3	1									2	3			1	11
Duke			5		1			2				1			2	3				11	25

1. Journal of Educational Psychology
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15. Elementary School Journal
16. School and Society
17. Educational Leadership
18. Mathematics Teacher
19. School Science and Mathematics
20. Journal of Abnormal and Social Psychology

Total 5 years - 20 journals

School	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
Florida	3	1					2	2	4	2	7				1	5	12	2	2	1	44
Florida State	1	3	1	1	3	1	4	4	1		2	2			3		4	4	1		35
Fordham					1				2							2					5
Peabody	2		1				2		1		1	2				1	8	4		1	23
George Washington							1				2					1					4
Georgia	1	5	3	1	1	3			4		1						1				20
Harvard	1		2	1	1	1	4	1	1	6	3	5	24			3	3	6		48	110
Houston							1						1		2		1	1		4	10
Illinois	17	8	21	3	1	4	6	2	5	7	7	5	2	5	8	6	5	15	6	25	158
Indiana	2	7		2	1		13	4	1		1	4	1		2	5	6	1	3	9	62
Iowa State	2		1			3						6								2	14
Iowa	10	3	2	3		2		3		1	1	36	1		1	2		3	1	22	91
Johns Hopkins	1		1							1	1		3						1	8	16
Kansas		2		2	2		1	1			1	3			2	3			4	2	23
Kentucky	1				2			1		1	1	4								1	11
Louisiana State			2							1								1	2	4	10
Loyola (Ill.)	1		1	1									1						1		5
Maryland		1		2		1	1	1			3	2					5	3	2	4	25
Michigan	7	4	4	2	2	1	4	2			1	3	3	1	1	14	4	2	4	29	88
Michigan State	7	10	13	2	2	1		2		1	4	1			1	4	6		5	5	64
Minnesota	4	2	5	12		2	11	7	1	3	9	6		1	6	9		5	3	14	100
Mississippi	1	1					1				2				1						6
Missouri	1		2			2	2		1							1			1		10
Nebraska	3	4	2	1	1	2	3										15	1		2	34
New York Univ.		2	4		49		3	4		3	2	2	5	1	1	32	14	9	1	8	140

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17. Educational Leadership
18. Mathematics Teacher
19. School Science and Mathematics
20. Journal of Abnormal and Social Psychology

Total 5 years - 20 journals

School	Journal																				Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
North Carolina	2	1	1		3		2					1			1		1			4	16
North Carolina State	2																				2
North Dakota									1							2					3
North Texas State		2		1			1					1				1	1				7
Northwestern	4			1	1	1	4	2	2	1	1		2	1	2	4	2	1	5	28	62
Notre Dame									2							2					4
Ohio State	3	3	1				4		5	1	3	4	1		3	1	28	2		10	69
Oklahoma		2			3	3	1	1			1		1		1	1		5		3	22
Oregon	1	2	2			3	2	1	5	3	1	1				2	1		6	3	33
Oregon State	3						1									1	1				6
Pennsylvania		1		1	1		1					3	2		2	3	1	1	1	8	25
Penn State	3	2	6		1	2	2		1	1	2	6				7			1	5	39
Pittsburgh	4	8	5			1	5		5	1	6	1		1		4			1	8	50
Purdue	5	1	7	3			2	2		1	3	5			3	2		4	5	4	47
Rutgers					1	1	1		1		4				1	1		4		1	15
St. Johns Univ.																					
St. Louis Univ.		1														1		1	2	1	6
South Carolina									1	1					1						3
South Dakota																					
Stanford	3	1	3		2	5	7	3	1		2	9	2	15	5	3	8	2		12	83
Syracuse	3	2	1				1	2	1		1				4	6	2	1		5	29
Temple	1	3	2	3		1	3		3	1	3		1			1					22
Tennessee	1		3		1		1		1			1				1				2	11
Texas	4	6	4			13	9	2	1	1	2	6		1	4	1	5	1	2	16	78
Texas Women						1															1

1. Journal of Educational Psychology
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Total 5 years - 20 journals

School	Journal 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
Utah	1	2	1				2		3	1	6				1	1	4				22
Utah State	1	1	1																		3
Virginia		1		2					2									6	1	1	13
Washington State	2	2			1	1		1													7
Univ. of Washington			2	2	1	1	4	2	1			2						2		13	30
Washington Univ.			2			1	1					3	2				1			2	12
Wayne State	2			3	5		2		3			3		1	3	5	8		2	4	41
Wisconsin	5	7		7	5	1	6	5		1	3	1			5	4	4	9	4	21	88
Wyoming	1	2						1	4		1					3					12
Yale	2	1		1	4	2					1	7	4			1		4	1	37	65

A suitable index would be of considerable value in assessing the level of work already accomplished and in the planning of work to be done. Until a satisfactory conceptual basis for such measures can be established we are likely to continue to have wide differences of opinion. An extensive search of the literature by Ackoff[4] indicated that little had been done toward the appraisal of existing indices and measures. An exception wh at was cited was Brodman[5] "Choosing Physiology Journals." Brodman questioned the validity of a fundamental assumption of the citation count index: that "the value of a periodical to a professional worker is in direct proportion to the number of times it is cited in the professional literature." Rankings were obtained of periodicals in their order of utility as judged by members of the Department of Physiology, Columbia University. A separate rating based on ranking on basis of number of citations in four of the leading journals in the field. The correlation obtained was so low that "a grave doubt was thrown on the validity of the . . . basic assumption." Brodman concluded that little value could be put on citation counts as a guide to the value of periodicals. Westbrook[6] in an article "Identifying Significant Research" used an approach similar to citation counts for evaluating scientific laboratories.

Martin[7] tabulated all of the citations made in articles appearing in the Journal of the Operations Society of America, 1958-60. Eight articles that had been cited most frequently were designated as "high" citation articles. Eight "normal" articles were then selected at random from among those not in the high citation group. "Normals" were matched with "high" relative to total number of articles referenced and number from any given year in order to minimize the effect of elapsed time and journal origin.

Citations were categorized by type ("mentioned" at end of article, "mentioned" in body of article or "dependent mentioned" if the citing article could not have been written without the article being cited.)

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[4] Ackoff, R. L. "Towards a behavioral theory of communication," Management Science 4:218-234, April 1958.

[5] Brodman, E. "Choosing physiology journals," Medical Library Association Bulletin 32:479-483, 1944.

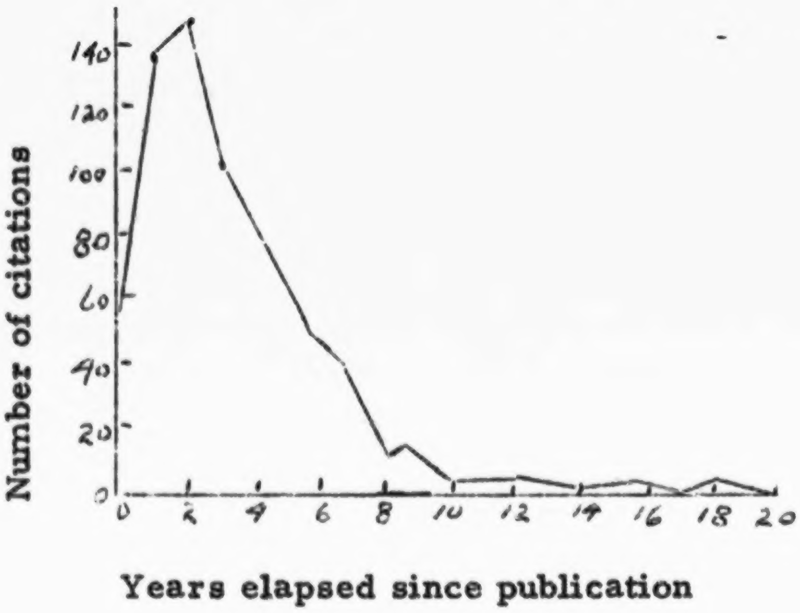
[6] Westbrook, J. H. "Identifying significant research," Science 132:1229-1234, October 1960.

[7] Martin, M. W. "The Measurement of Value of Scientific Information," in Dean, B. V. (Ed.) Operations Research in Research and Development, New York: Wiley, 1963.

The faculty of the Operations Research Group at the Case Institute of Technology served as the panel of experts. Each was given a pair of articles and asked to indicate which of the two was the more valuable.

Effects of elapsed time and publication source were analyzed for impact on number of citations received. Results are shown in the figure.

Figure 7. Number of citations by year elapsed since publication, Journal of the Operations Society of America, 1958-1960



The experts who had evaluated the articles were asked, after they had completed their rankings, about the criteria they had used. The five most frequently mentioned criteria were:

1. The amount of inspiration it gave to others in the field.
2. The quality of the research done.
3. The number of applications that could be made from the results reported.
4. The amount of synthesis of known facts, provided it was carefully done.
5. The effect of the article on general principles of the discipline.

Thus, within the Martin study, experts chose ordinary-citation articles almost as frequently as high-citation articles as being the more valuable. While the sample was limited, the conclusion appears consistent with the view that citation counts ought not be used as the sole index of value of scientific articles. The conclusion agrees with that of Brodman. Of course, a study done on a larger sample would be more definitive.

The effect of elapsed time since publication on the number of situations received was more biased toward recent years than the studies of Weiss[2] and Westbrook[6]. This may be in part due to the fact that Operations Research is a new field.

In the search for alternative measures of value of scientific information, one is tempted to turn to measures of information developed by Shannon[8]. Best information as treated by Shannon is a physical concept which has not relationship to the meaning that is communicated, or its effect on the receiver. It is only a measure of the amount of message rather than the amount of information contained in the message. Syntactic and semantic considerations are explicitly excluded from Shannon's "bits." These concepts are useful to communications engineering in evaluating channel capacity, but they are quite useless for evaluating human communications. Cherry[9] distinguishes between Shannon's communication theory and human communication theory.

Ackoff[4] provided some ideas toward a theory of human communication. Basically he indicates that - "to the extent that the message affects the probabilities of choice P_i, it is said to inform; to the extent it changes E_{ij} (the efficiency of a course of action for attaining outcome O), it is said to instruct; and to the extent that it changes V_j (relative values), it is said to motivate. Thus a message is said to have three possible kinds of effect and content; it does not involve exclusively the transmission of information. Any single message may inform, instruct, or motivate or do a combination of these. Information refers, in this context, to what an individual does, instruction to how he does it, and motivation to why he does it."

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[2] Op. cit.

[6] Op. cit.

[8] Shannon, C. E. and Weaver, W. The Mathematical Theory of Communication. Urbana: University of Illinois Press, 1940.

[9] Cherry, C. On Human Communications, New York: Wiley, 1957.

Properties that a message contains depend not only on the message and the receiver but also in the researcher who must represent the situation in a purposeful state. Different observers can represent the situation differently--a statement true of all psychological measurement.

These ideas were and are still being explored relative to the data of the present study. It was hoped that the conditional probabilities could be stated in a form that could be handled by the General Inquirer Program, but this effort has not proved successful so far.

Summary: Wide variations in number of publications were observed and indicated. About one-fourth of the schools granting the doctorate in education produced zero publications during the five year period, 1953-57. Efforts to evaluate the quality of these publications did not meet with success.

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[4] Op. cit.

CHAPTER VI

DOCTORAL THESES

It was the intent of the present study of doctoral theses submitted at various schools during the period 1953-57, to discover merely the relative frequency of various topics covered. In the event that there were resources available it was hoped to be able to take a five per cent random sample to analyze in greater detail.

Procedure: The procedure for obtaining the titles was to use the Research Studies in Education, of 1953, 1954, 1955, 1956, and 1957 published by Phi Delta Kappa, Inc. Topics are listed under the categories of the 1953 edition. Theses found in the 1954 to 1957 editions were classified by our staff to fit the 1953 rubrics. The attempt was to obtain an exhaustive coverage. No sampling was involved so far as the tabulations of topics and titles is concerned. No attempt was made to categorize the characteristics of these studies. If time and resources permitted it was planned to take a five per cent sample of topics, look up the abstracts in the Dissertation Abstracts, and make an analysis of the strategies, the data, the problem, the treatment of data, etc using a scheme similar to that of Wolfle.

No tests of significance were applied because they did not seem to be pertinent to the questions being considered--that of topics. It would be difficult to argue that a difference is or is not significant because random sampling did not obtain.

Results: Results are presented in tables 86 to 88 and in Appendix H. Table 86 summarizes the frequencies of theses in terms of the various topical headings, 46 in all. Table 87 summarizes the frequencies of topics covered by the doctoral theses submitted at each school in the study during the period 1953-57. Table 88 presents the total number of theses submitted at each institution in the study during the period 1953-57. Appendix H lists the actual titles by institution at which they were submitted.

Table 86 indicated that the most frequent or most popular topics for doctoral theses during the five years 1953-57 were their rank order:

(1) Personnel Services (Student Problems, Guidance, Counseling)
(2) Psychology
(3) Arithmetic, Science, Mathematics
(4) Administration
(5) Art and Music
(6) Teacher training

(7) Philosophy
(8) Measurement and evaluation
(9) Vocational Education
(10) International Education

The least frequent categories were:

(1) Driver Training and Safety Education
(2) Educational research
(3) Biographies, Directories
(4) Foreign language
(5) Junior high education
(6) Recruitment
(7) Rural education
(8) Recreation
(9) Intercultural education
(10) Junior college
(11) and (12) Supervision and Legislation each had 81 theses listed.

The ten most frequent topics account for 4499 or about 48 per cent of all theses. The ten least frequent topics account for 477 or about 5 per cent of the theses. In other words most popular topics are selected about 10 times as often as least popular ones.

No tests of significance were made because the assumptions of random sampling underlying their use was not satisfied.

Table 87 is an extensive tabulation of frequency of topics covered by doctoral theses submitted at the various schools in the study during the period 1953-57. Table 87 extends over 15 pages. In order to read this table it sould be noted that the topics are listed across the top of the page, and schools are listed vertically. It takes three pages of the table to cover all of the topics for a given set of schools. Thus the first three pages cover all of the topics under which theses were tabulated for schools ranging alphabetically from Alabama Polytechnical to Cornell; the next three pages of the table cover all of the topics under which theses were tabulated for institutions ranging from the University of Denver to Louisana State. The next group of three pages indicated the distribution of topics for schools ranging alphabetically from Loyola to the University of Pennsylavnia. The next group of schools ranges from Pennsylvania State University to the State College (now University) of Washington. The final group of schools covering three pages of the table ranges alphabetically from the University of Washington to Yeshiva University. Thus every third page lists total number of theses submitted at each institution during the period 1953-57.

Table 88 indicates the total number of theses that were listed, by the sources used in the present study, as having been completed at these institutions. The ten most frequent are:

1.	Columbia University	1445
2.	New York University	800
3.	Ohio State University	337
4.	Indiana Univeristy	331
5.	Stanford University	326
6.	University of Southern California	257
7.	Pennsylvania State University	254
8.	University of Pittsburgh	253
9.	University of Minnesota	237
10.	University of Michigan	205

Table 86-A
Summary of Doctoral Theses Topics in Various Schools, 1953-57.

Topic	No.
Physical Education	212
Vocational Education	294
Business Education	260
Agricultural Education	151
Personnel Services (Student Problems, Guidance, Counseling)	829
Health Service	116
Legislation	81
History	124
Psychology	733
Childhood and Youth	216
Teacher Training	354
Measurement and Evaluation	332
Audio-Visual	130
Extra-Curricular Activities	204
Methods of Teaching (Teaching Aids, School Libraries)	94
Inter-Cultural Education	63
Pre-School, Kindergarten, Elementary Education	167
High School Education	173
Jr. High Education	39
Language Arts	211
Driver Training, Safety Education	24
Recreation	47
Combined Physical Ed., Recreation, Health and Safety	94
Special Education	249
Family Life and Home Economics	116
Rural Education	44
Teachers' Problems	257
Higher Education	162
Professional Education	264
Jr. College	75
Adult Education (Veterans, Extension)	153
Educational Research, Biographies, Directories	30
Philosophy	343
International Education	276
Religious Education	184
Administration	463
Supervision	81
Public Relations	94
Recruitment	43
Transportation	157
Finance	174
Reading, Literature	254
Foreign Language	31
Arithmetic, Mathematics, Science, Aviation	470
Social Studies	221
Art, Music	405
Total	9,494

(Topics listed above are those found in *Research Studies in Education*, 1953, published by Phi Delta Kappa, Inc. Topics found in the 1954, 1955, 1956, and 1957 issues of this publication have been combined to fit the 1953 topical breakdown.)

Table 87

FREQUENCY OF TOPICS COVERED BY DOCTORAL THESES SUBMITTED AT VARIOUS SCHOOLS, 1953-57

Frequency of Topics Covered by Doctoral Theses in Various Schools, 1953-57

	Physical Ed.	Vocational Ed.	Business Ed.	Agricultural Ed.	Personnel Services	Health Service	Legislation	History	Psychology	Childhood and Youth	Teacher Training	Measurement & Evaluatio	Audio-Visual	Extra Curricular Activ.	Methods of Teaching	Inter-Cultural Ed.	Pre-School, Kindergarten Elementary Ed.	High School Ed.	Jr. High Ed.
Alabama Poly	1		1		1		1												
U. of Alabama			1																
American U.																			
Arizona State								1	2	1								2	
U. of Arkansas		1		1	4		1		1			1		2		1	1	1	
Baylor																			
Boston U.	4	2	2		17	8		1	15	4		30			3		3	1	
Bradley		28			4		1		6			2	1		2			1	2
U. of Buffalo		9	2		7	2		2	4	5		1	1	5	1		1	6	1
Cal. (Berkeley)	3	1	1		11	2			19	13		4	1	5	4	3	4	2	4
Cal. (L.A.)	3	4	7	4	12	2		7	5	2		3	7	2	1		2	1	1
U. of S. Cal.	11	3	8		22	3	13	2	17	3		11	4	7	2		6	4	1
Catholic U.					6			2	3	1		1		1			1	2	
U. of Chicago			1		5			3	13	2		5	2	4	3	1		3	
Chic. Musical																			
U. of Cincinnati									1	1									
Claremont									1										
U. of Colorado	1		3		33		3		6	1		3	3	4	3		6	2	2
Colorado State		2	2		19	3		2	4	9		12	1	2	5		4	3	4
Columbia	38	24	31	1	109	13	5	6	74	25		12	16	50	21	11	33	25	
U. of Conn.		1	1		3		1		1	2		5						3	2
Cornell	2	8	1	13	11	1		4	9	1		2	1	3			1		1

	Language Arts	Driver Train. Safety Ed.	Recreation	Combined Physical Ed., Recreation, Health, Safety	Special Ed.	Family Life & Home Econ.	Rural Ed.	Teachers' Problems	Higher Ed.	Professional Ed.	Jr. College	Adult Education	Educational Research Biographies, Directories	Philosophy	International Ed.	Religious Education	Administration	Supervision	Public Relations
Alabama Poly.									1								1	1	
U. of Alabama																	2		
American U.										1					1	1			
Arizona State					1			1								2	2		
U. of Arkansas					1			2	1		1			2			3		1
Baylor					1													1	
Boston U.	16	3		3	3			2		2	1	1		5	3	2	6		
Bradley		1							1	1						3			
U. of Buffalo				2	2	1		7		6		5	1	5	1	2	6	1	3
Cal. (Berkeley)	1		1	3	3	1		6		4	6	3		8	6	4	14	2	
Cal. (L.A.)	3			1	8	4		1	3	2	4	5		2	3		5		1
U. of S. Cal.	6		1	2	11	1	1	3	2	7	4	5		8	4		32	2	5
Catholic U.	1							1	1					7	4	5	3		
U. of Chicago	1					1		7	5	5	2	5	1	9	3	2	9		3
Chic. Musical	1																		
U. of Cincinnati					1	1				1				2		2			
Claremont														2					2
U. of Colorado	3	1		2			1	4	1	3	3	4		2	4	5	14	2	1
Colorado State	5	1			1		1	6	1		2	1		6	1		4	2	
Columbia	28	3	16	18	36	40	6	36	20	37	5	30	7	62	72	26	65	21	24
U. of Conn.	2				2			2		1				2	4				
Cornell		1				6	11	7	3	4	1	3		6	5	1	3	2	1

	Recruitment	Transportation	Finance	Reading, Literature	Foreign Language	Arithmetic, Mathematics, Science, Aviation	Social Studies	Art, Music	TOTAL
Alabama Poly.			2			2			11
U. of Alabama			1	1				1	7
American U.									3
Arizona State			1					1	15
U. of Arkansas	1	2	3			1			34
Baylor		2				1			5
Boston U.				12		12	2	10	174
Bradley			1	1		2			57
U. of Buffalo	1	3	1	1	1	6	1	3	110
Cal. (Berkeley)		5	4	6	2	7	4	2	176
Cal. (L. A.)		1	3	4		3	3		120
U. of S. Cal.	1	4	13	6		5	1	12	257
Catholic U.			1	1		6	1	1	54
U. of Chicago			2	6		3	5	5	120
Chic. Musical									1
U. of Cincinnati		1				1		2	13
Claremont									7
U. of Colorado	2	1	4	7	1	10	2		151
Colorado State	1	4	1	8		15	6	4	149
Columbia	6	22	24	27	8	80	39	142	1,445
U. of Conn.			6	1		2		1	45
Cornell		3	1	7		14	1	2	142

	Physical Ed.	Vocational Ed.	Business Ed.	Agricultural Ed.	Personnel Services	Health Service	Legislation	History	Psychology	Childhood & Youth	Teacher Training	Measurement & Evaluation	Audio-Visual	Extra-Curricular Activ.	Methods of Teaching	Inter-Cultural Ed.	Pre-school, Kindergarten, Elementary Ed.	High School Ed.	Jr. High Ed.
Denver		3	4		12		1	1	13	3		5			1		1	1	
Dropsie								6				1							
Duke					1		4												
U. of Florida	3	8	2	2	9		1	2	7			1		5	2	1	1	2	
Florida State					9		1		4	1		4		1		1	2	2	
Fordham		2	1		6			1	3	2		2					3		
Geo. Peabody	6	4			2	2	7	9	12	1		5		12		1		2	3
Geo. Washington					10			1				2		1					
U. of Georgia				1	4				1	2		4							
Georgetown																			
Harvard				2	7	1		1	12	4		3		1	1	1	2	1	
Hartford Semin.																			
U. of Houston	2	2	3	3	7	1			3	3		4	4	5	1			2	1
U. of Illinois	3	1	2	11	12	1		2	22	6		7		4	1	1	1	6	
Indiana	7	5	13	1	41	6	1	4	17	3		14	17	1	5	5	3	4	1
Iowa State	2			5	4				2	1		6	5					2	
U. of Iowa	22		9		5	10	1	1	9			9	1	3	5		5	3	
J. Hopkins					2														
U. of Kansas		1			4	1			3	4		3	1	1			1	2	
U. of Kentucky	1	1	2	2	1					1								4	
Louisiana State	1			10	2			3	1	2		5		1	1			2	1

	Language Arts	Driver Train. Safety Ed.	Recreation	Combined Physical Ed., Recreation, Health, Safety	Special Ed.	Family Life & Home Ec.	Rural Ed.	Teachers' Problem	Higher Ed.	Professional Ed.	Jr. College	Adult Education	Educational Research Biographies, Directories	Philosophy	International Ed.	Religious Education	Administration	Supervision	Public Relations
Denver	4				3		1	6	2	4	2	8		5	3	2	8		2
Dropsie												1		1	11	13			
Duke								1	1				1				2	1	
U. of Florida	3			1	1			4		1		3		7	2		7		2
Florida State	1				1	1	1	1		1	1	2		1					
Fordham	3									1				1	1	4	1		1
Geo. Peabody	2			3	6	2	1	4	11	4	2			8	3	1	17	2	2
Geo. Washington	1				1			1		2				1				1	
U. of Georgia								1		3						1	5	1	1
Georgetown									1										
Harvard						1		4	2	3				5	6	4	5	1	1
Hartfor Semin.															1				
U. of Houston	3							5	1	1	3	2		4	2		2		
U. of Illinois	4	1		1	11	7	1	6		4	2			10	3		13		1
Indiana	5	2	2	12	12		3	11	3	11	2	6	2	6	18	4	10	3	1
Iowa State	3	1	1	2	4	1				2	1	2			2		1	1	
U. of Iowa	12			9	6	1		2	4			3		1	4		2		
J. Hopkins																			
U. of Kansas	1				2				2	4				2	2	1	4	1	
U. of Kentucky							1			1				7	1	2	2		2
Louisana State	1							3	1					1				1	

	Recruitment	Transportation	Finance	Reading, Literature	Foreign Language	Arithmetic, Mathematics, Science, Aviation	Social Studies	Art, Music	TOTAL
Denver	2	4	1	4	1	4	1	3	125
Dropsie					1				35
Duke			1			1			14
U. of Florida	1	2		1		7	2	5	102
Florida State	1	1	1			1	1		44
Fordham			3	2		3			42
Geo. Peabody	1	5	6	3	1	12	17	16	201
Geo. Washington		1							24
U. of Georgia									25
Georgetown									1
Harvard			3	2	1	5	4		84
Hartford Semin.									1
U. of Houston	1	4	4	3	1	3	2	2	92
U. of Illinois	1	1		2		18	3	10	183
Indiana	3	5	6	6	1	9	4	14	331
Iowa State			1			5	2	3	59
U. of Iowa		1	1	4		16	6	4	167
J. Hopkins									2
U. of Kansas		1	1	2		5	1	9	62
U. of Kentucky						1	2		33
Louisana State		3		6		3		1	50

	Physical Ed.	Vocational Ed.	Business Ed.	Agricultural Ed.	Personnel Services	Health Service	Legislation	History	Psychology	Childhood & Youth	Teacher Training	Measurement & Evaluatic	Audio-Visual	Extra Curricular Activ.	Methods of Teaching	Inter-Cultural Ed.	Pre-School, Kindergarte: Elementary Ed.	High School Ed.	Jr. High Ed.
Loyola		1			2				1			1		2		1			1
U. of Maryland	2	1		2	2	2		1	13	2		2	2	1	1	1		1	
U. of Michigan	10	8	7	1	19	8		3	21	8		13	4	3	2	1	4	1	
Michigan State			2	15	21	3			15	1		5	6	7					
U. of Minnesota	2	17	4	11	24	2	1		36	6		15		1	5		3	1	
U. of Mississippi		1					1						1					1	
U. of Missouri		40	4	2	17		2		6	1		3		1	1	1	2	4	1
U. of Nebraska			3		14		1		13	5		5	1	3	1	1	4	4	
New York	42	30	51	1	45	13	4	18	136	31		22	14	14	4	16	15	9	1
U. of N. Carolina	3	1	1		5	1	1	3	2			1		1			2	2	1
N. Carolina State														1					
U. of N. Dakota		2	1		1				1			1		1		1			
N. Texas State				1	1				3			1							
Northwestern		2	13		29	1			13	3		4	2	3		1	7	5	1
U. of Notre Dame								1											
Ohio State	4	16	15	12	9			1	7	2		8	3	4	1	1	5	8	3
Oklahoma A & M			1	3	4		1	1	5			3	1				2		
U. of Oklahoma		3	10		6	1	3	1	3	2		4	2			1	1	1	1
U. of Oregon	10	2	2		2	4		3	2	1		3		4			1		
Oregon State		2	2		11	2	1	1	2			1		1	1		1	1	
U. of Penn.			1	6	5		4		5			2		1					

	Language Arts.	Driver Train. Safety Ed	Recreation	Combined Rhysical Ed. Recreation, Health, Safe	Special Ed.	Family Life & Home Ed	Rural Ed.	Teachers' Problem	Higher Ed.	Professional Ed.	Jr. College	Adult Education	Educational Research Biographies, Directories	Philosophy	International Ed.	Religious Education	Administration	Supervision	Public Relations
Loyola								1				2		1	1	1			
U. of Maryland	1		1	2	2			5	1	2				3	10		5	1	2
U. of Michigan	5		4	6	5		2	3	4	5	1	2	1	7	7	1	1	1	2
Michigan State	5			1	3	6	2	2	8	3		6		4	3	3	11		3
U. of Minnesota	6		2			3		8	5	16	2	3	1	3	6	2	3		
U. of Mississippi										2				1			3	2	
U. of Missouri	7	1		1	6	4	1	4	2	7		1		5			12	1	4
U. of Nebraska	1				3		6	6	5	1		3		3	1	2	11	3	3
New York	10	5	15	6	37	8	3	20	15	20	3	6	3	20	14	18	15	1	1
U. of N. Carolina				2	1			1	3	9		1	1	7	1		7	2	
N. Carolina State																			
U. of N. Dakota								2						1					1
N. Texas State						2			2	2									
Northwestern	7				9		1	2	2	2		3		6		2	8		1
U. of Notre Dame															1				
Ohio State	8			3	8	9		6	3	3		5		11	12	1	8	2	
Oklahoma A & M	1				2				1	4				2		1	7		
U. of Oklahoma	2	2			5			1	1	2	1	2		2	1	2	8	2	1
U. of Oregon	2			1	2			2	1	1		1		1	12		3		
Oregon State					1					1	1				1				
U. of Penn				1	2			1		7				1	5	3	4	1	

	Recruitment	Transportation	Finance	Reading, Literature	Foreign Language	Arithmetic, Mathematics, Science, Aviation	Social Studies	Art, Music	TOTAL
Loyola	1		2				2	1	21
U. of Maryland	3			3		3	3		87
U. of Michigan	1	3	1	11	2	3	6	3	205
Michigan State		2	1	5		3		5	156
U. of Minnesota	1		1	11		15	5	6	237
U. of Mississippi									12
U. of Missouri	1	3	6	3		6	3		158
U. of Nebraska	1	4	3	3		3	4	2	131
New York	4	7	4	18	2	32	21	26	800
U. of N. Carolina		2	4			2			67
N. Carolina State						1			3
U. of N. Dakota	1		3			3	1	1	25
N. Texas State		1	3			3			22
Northwestern		1		11	1	11	1	9	169
U. of Notre Dame						1			3
Ohio State		4	3	2	1	22	6	7	237
Oklahoma A & M				1		4	1		51
U. of Oklahoma				6		7	2	1	89
U. of Oregon						3	2	8	77
Oregon State			1			4		2	38
U. of Penn.		1	1			3	1	6	65

	Physical Ed.	Vocational Ed.	Business Ed.	Agricultural Ed.	Personnel Services	Health Service	Legislation	History	Psychology	Childhood & Youth	Teacher Training	Measurement & Evaluatio	Audio Visual	Extra Curricular Activ.	Methods of Teaching	Inter-Cultural Ed.	Pre-school, Kindergarten	Elementary Ed.	High School Ed.	Jr. High Ed.
Penn. State	5	11	6	26	15	1	2		33	3		9	10	7		1		4	3	
U. of Pittsburgh	1	7	15		18		11	4	10	4		3	2	4				5	11	3
Purdue		2	1	1	12				5	2		6							1	
Rochester																				
Rutgers					7	1	2	5						1						1
St. Johns					5				1			1		1					1	
S. Baptist					1															
Southwestern Baptist					2															
St. Louis			1		3		1		3						1	1				
U. of S. Carolina																				
Stanford	5	3	5	2	31	11	1	4	19	6		3	5	9	4	1		6	6	
Syracuse	1			1	7			3	8	2		9	3	1				4	2	
Temple	4	1	5		8	4	2	1	5	3		7	1	1				1	2	
U. of Tennessee		3	1		8				4	2		4		1	1	1			1	
U. of Texas	2	2	2	1	15	3		2	32	12		4	1	3	2	1		5	4	2
Tulane									1											
U. of Utah	1		1		1			2	3			2							2	
Utah State				1	2					1				1				1		
U. of Va.					3			2	1	1		1		1	2			1	4	
Vanderbilt																1				
State College of Washington	2			1	13			1	3					1					1	

	Language Arts.	Driver Train. Safety Ed.	Recreation	Combines Physical Ed. Recreation, Health, Safety	Special Ed.	Family Life & Home Ec.	Rural Ed.	Teachers' Problem	Higher Ed.	Professional Ed.	Jr. College	Adult Education	Educational Research Biographies, Directories	Philosophy	International Ed.	Religious Education	Administration	Supervision	Public Relations
Penn State	1		2	4	9	7		5	4	11	1		1	5	6	1	6	2	2
U. of Pittsburgh	7	1	1		6	1		13	1	6		2	3	3	2	26	20	2	2
Purdue					1			1		2		1				1		1	
Rochester																			
Rutgers					3				1	3		2		1	2		4		
St. Johns																1			
S. Baptist					1											3			
Southwestern Baptist					1				1	1		1		2	1	14			
St. Louis	1								1					1		2	1		
U. of S. Carolina										1									
Stanford	13			1	9	3		12	6	16	3	5	2	18	8	1	18	3	4
Syracuse				1	3	1				1		1	1	2			1		2
Temple	4			3	1	1		1		1		2		4		3	7		2
U. of Tennessee								3		3	2	2		3	3		10	3	
U. of Texas	6			1	2			6	5	3	10	1		11	1	2	5	3	4
Tulane																			
U. of Utah				1		1		3	2			1		1	1	1	2		
Utah State					1									1			1		
U. of Va.	1								1	3		1		1			2	1	1
Vanderbilt																			
State College of Washington	1							1	3	1	4		2	1			4		

	Recruitment	Transportation	Finance	Reading, Literature	Foreign Language	Arithmetic, Mathematics, Science, Aviation	Social Studies	Art, Music	TOTAL
Penn. State	1	5	2	4	2	13	5	21	254
U. of Pittsburgh		7	6	10		11	8	6	253
Purdue						1			38
Rochester								5	5
Rutgers		1		3		3			42
St. Johns						1			11
S. Baptist									5
Southwestern Baptist									23
St. Louis				1			1		18
U. of S. Carolina				1				1	3
Stanford		23	8	4	1	6	15	13	326
Syracuse				8		6	3	4	81
Temple		2	1	7		1	2		88
U. of Tennessee		3	6			1	1		72
U. of Texas	2	3	2	2	1	1	3	10	183
Tulane									1
U. of Utah						2		1	29
Utah State							1		13
U. of Va.			1	3		3		3	40
Vanderbilt									1
State College of Washington			3	1		1			45

	Physical Ed.	Vocational Ed.	Business Ed	Agricultural Ed.	Personnel Services	Health Service	Legislation	History	Psychology	Childhood & Youth	Teacher Training	Measurement & Evaluat	Audio Visual	Extra Curricular Activ.	Methods of Teaching	Inter-Cultural Ed.	Pre-School, Kinderg. Elementary Ed.	High School Ed.	Jr. High Ed.
U. of Washington	1	5	1		8	1	1	1	6	4		4			1			2	
Wash. St. Louis		1		1	4		1			1		5							
Wayne		17	3	2	9	3			2	1		2	2	7	3	1	4	4	
Western Reserve	1				2				2			1							
U. of Wisconsin	4	5	2	5	27			2	11	6		5	3	1	1	3	3	2	
U. of Wyoming	2	1	3		8				1				1		1		3	1	
Yale			1		2			6	7	1		3	1			1	2	1	
Yeshiva									1			1							

	Language Arts,	Driver Train, Safety Ed.	Recreation	Combined Physical Ed. Recreation, Health, Safety	Special Ed.	Family Life & Home Ec.	Rural Ed.	Teachers' Problem	Higher Ed.	Professional Ed.	Jr. College	Adult Education	Educational Research Biographies, Directories	Philosophy	International Ed.	Religious Education	Administration	Supervision	Public Relations
U. of Washington	3			1	3			3	2	2	1		1	2	1		5	1	
Wash. St. Louis			1					3		1							1		
Wayne	2				4	1		4	1	2	2	2	2	8	4	1	3	1	3
Western Reserve					1							1				1			
U. of Wisconsin	2				1	1	1	6	3	3		7		7	3		4	1	
U. of Wyoming	2	1						4	6	1	2			1		1	7		1
Yale	2				3			3	4					6		3	8	1	1
Yeshiva									1					1	1				

	Recruitment	Transportation	Finance	Reading, Literature	Foreign Language	Arithmetic, Mathematics, Science, Aviation	Social Studies	Art, Music	TOTAL
U. of Washington		4	5	5	1	3	1		81
Wash., St. Louis						2	1		23
Wayne	2		3	2		8	5	1	122
Western Reserve						1			10
U. of Wisconsin	1	1	6	3	2	14	4	4	162
U. of Wyoming	2	4	1	1		2		2	61
Yale			1	2		4	2	3	71
Yeshiva									5

Table 88. Total Number Of Theses Completed In Education At Each School In The Study, 1953-57

School	Number	School	Number
Alabama Polytech	11	U. of Mississippi	12
U. of Alabama	7	U. of Missouri	158
American U.	3	U. of Nebraska	131
Arizona State	15	New York University	800
U. of Arkansas	34	U. of N. Carolina	67
Baylor	5	N. Carolina State	3
Boston U.	174	U. of N. Dakota	25
Bradley	57	N. Texas State	22
U. of Buffalo	110	Northwestern	169
California (Berkeley)	176	U. of Notre Dame	3
California (L.A.)	120	Ohio State	337
U. of S. California	257	Oklahoma A & M	51
Catholic U.	54	University of Oklahoma	89
U. of Chicago	120	U. of Oregon	77
U. of Cincinnati	13	Oregon State	38
Clarement	7	U. of Pennsylvania	65
U. of Colorado	151	Penn State	254
Colorado State	149	U. of Pittsburgh	253
Columbia	1445	Purdue	38
U. of Connecticut	45	Rochester	5
Cornell	142	Rutgers	42
Denver	125	St. Johns	11
Dropsie	35	So. Baptist	5
Duke	14	Southwestern Baptist	33
U. of Florida	102	St. Louis	18
Florida State	44	U. of S. Carolina	3
Fordham	42	Stanford	326
G. Peabody	201	Syracuse	81
G. Washington	24	Temple	88
U. of Georgia	25	U. of Tennessee	72
Harvard	84	U. of Texas	183
U. of Houston	92	Tulane	1
U. of Illinois	183	U. of Utah	29
Indiana U.	331	Utah State	13
Iowa State	59	U. of Virginia	40
U. of Iowa	167	Vanderbilt	1
John Hopkins	2	State College of Washington	45
U. of Kansas	62	U. of Washington	81
U. of Kentucky	33	Wash. U., St. Louis	23
Louisiana State	50	Wayne	122
Loyola	21	Western Reserve	10
U. of Maryland	87	U. of Wisconsin	162
U. of Michigan	205	U. of Wyoming	61
Michigan State	156	Yale	71
U. of Minnesota	237	Yeshiva	5
			9,494

CHAPTER VII

DISCUSSION OF RESULTS WITH RESEARCHERS FROM OTHER FIELDS

The title of the project as submitted was, and is, ". . . and an appraisal by scientists from other fields." This expressed the intent and procedure of the original proposal. On the basis of our previous experience it appeared to be reasonable that competent people from other fields would be willing and able to engage in a useful dialogue. However, when the time "to put the chips on the line" actually came several people who previously had appeared willing begged off for a variety of reasons but mainly because they appeared reluctant to engage in such dialogue. The original words are retained in the title because the intent was retained in the dialogues, but a more accurate title would be ". . . a discussion of educational research with people from cognate fields."

Sample: The original sample comprised about 64 people from the fields of psychology, sociology, economics, linguistics, statistics, and the logic and history of science; located in five midwestern universities. Approximately 34 people responded somewhat positively and 29 were actually reached for the discussions.

Procedure: The procedure was to indicate that the purpose of the discussion would be to review intent and procedures of the study, to look at some of the results, and then to discuss their impressions that they might be willing to indicate of educational research as a field of inquiry especially their impression as to its level of development in comparison with their field. In many respects the procedure paralleled that of the interview study. Discussions were held individually rather than in groups, and lasted approximately one to two hours in most instances. Notes were taken by the investigator during the discussion. The discussion began by a review of the current study--the intent of Appendix B, the two questionnaire studies, the tabulation of faculty publications (titles were not examined), and the titles of doctoral theses.

Some people attended to the topic at hand and discussed the project and educational research directly. Others approached the discussion more obliquely and considered topics in the philosophy of science.

Some noted similarities and differences between educational research and research in the cognate fields including the items of Appendix B. Another group explored the impact of increasing complexity of our technology upon educational demands, with some indication of the difficulty and amount of skills and learning to be mastered, the amount of ability and effort required to master these.

Results: This chapter will attempt to summarize the general substance of these discussions under the following headings:

A. General summary of comments
B. Observations on educational research
C. Observations on science
D. A model of the research process
E. Some observations on research
F. Technology and education
G. Review of studies on educational research.
H. Addendum to Chapter VII-Summary of the seminar on Education for research in psychology.

General summary of comments:

So many of the comments that were received had been summarized by the report of the seminar on Education for research in psychology that a summary of this report is given as an addendum to this chapter. This addendum reflects a majority of the reactions received from the present discussions. This summary should be read [illegible] in connection with this section.

The general consensus of the discussions on the nature of educational research can be summarized by the word "poverty:" Of ideas, personnel, influence, support, requirements for selection and preparation, conceptualization and execution.[1] It was indicated that undoubtedly there was a wide range of variation, and that while noteworthy and even outstanding examples could be found, the general average tended toward the end of poverty. Poverty in terms of experience was frequently indicated. Catalog study results indicated that the model offering appeared to be a course called introduction to research, a course in elementary statistical arithmetic, and/or a course in measurement. The topics indicated by the catalog description suggested that they seemed to be offered at an undergraduate level of difficulty. In addition requirements for graduate training appeared to be uniformly provincial in their orientation. There was very little opportunity for the student to become exposed to similar work in the academic disciplines.

In terms of the typical requirements for a graduate degree, education on the whole revealed little concern for research. Methodological and conceptual concerns were frequently regarded as barriers to "practical" understanding or to one's performance as a professional educator.

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[1] These comments summarize the discussions. Negative comments outweighed positive although the latter were not missing. It is difficult to appreciate the immense change that has taken place as a result of infusion of Federal support.

Whatever conception of educational practice may be inferred, it apparently allowed little room for inquiry and research.

One commentator indicated that almost any literate person could read the professional literature and easily go as far as the concepts go. The content and level of concepts appeared to be such that they could be comprehended even by those without specific training. The adequacy of the concepts in covering the field and in illuminating and improving practice was regarded as limited. The utility of concepts in making predictions regarding the likely specific outcomes appeared to be small. The amount of knowledge summarized by concepts or their depth was such that few could survive a searching examination for more than a few minutes before becoming exhausted.

Funds, facilities, equipment, and resources for educational research seemed to be scarce. A grant of $200 was regarded as a major grant. So far as could be determined the 100 plus institutions did not spend more than $200,000 for research or an average of $2,000 per school. Most of the time spent on research was that which the faculty member gave from his own free time.

Anti-intellectual attitudes were not characteristic of the respondents either on the questionnaire or the interviews. On the whole educational researchers esteemed inquiry or they would not have worked at it under the adversities indicated. The general attitude of the university, its administration, and faculty colleagues (who did not do educational research) was interpreted to be one of indifference.

On the whole politics play a large part in a public enterprise such as education. The safest course is not to do anything. Change is not comfortable and may even create problems. Many problems are found to work themselves out or go away, if left alone or ignored.

In historical perspective, educational research has suffered from a lack of standards of scholarship, an absence of critical review by colleagues, and a pervading tendency either to ignore or resent criticism from those outside of thefield. Many of the group commented that educational research has not come of age. With a few notable exceptions the general level of studies and the atmosphere for encouraging research was far from inspiring. Many ailments could be cited--too much emphasis on immediate "practical" solutions to isolated problems at the expense of concern about and sustained effort directed toward the development of systematic knowledge, too much tolerance of mediocrity in performance and shoddiness of intellectual effort, too little preparation in relevant substantive fields, and in knowledge of research methodologies and instrumentation, and too little data collection on various educational phenomena. These ailments were observed relative to the typical climate for encouragement and financial support of educational research.

Schools of education commonly offered an introductory course that attempted to teach the beginning graduate student some things about research. If the textbooks used by most of the schools at the time indicated the content of such a course, one can say that they tried to give an orientation relative to the strategy and tactics of educational research in vague general terms. Also, unfortunately these courses were regarded too often as ends in themselves. When a student completed them, he was led to feel that the knew enough about "the experimental method," "the survey method," and other cookbook procedures. Too often the research became an exercise in finding a topic to fit a method instead of involving genuine inquiry and problem solving. Most students had little research preparation beyond this. Throughout there appeared to be an need for clarifying the difference between a course that told "about" and a course plus a series of experiences that showed "how" inquiry was performed. The group reflected the opinions in the Addendum of this chapter: that while books and courses may help a beginner avoid some pitfalls, obtain a survey of some published research and techniques, and start to develop some critical attitudes, research competence is actually achieved by experience rather than by reading. Productive work requires ability, prolonged sustained effort, a social atmosphere that permits nonconformity and encourages originality in thinking.

Particularly important is the clarification of the role of theory in educational research. Too often "theory" was used as a term of ridicule--the distinction being between the "practical" or getting things done and the "theoretical" or day-dreaming.

Summary:

As indicated, the reviewers felt that educational research suffered from many ailments--too much emphasis on immediate practical solutions to problems without much concern about the development of a systematic body of knowledge of a field, too little emphasis on sustained effort, too much dilettantism too much amateurishness--lack of preparation in underlying substantive fields and in related techniques and methodology, lack of social atmosphere favorable to creative work, lack of financial and other support. It was common practice to offer a course that presumably taught a student how to do research. Reviewers pointed out that research competence is not so easily attained.

Reading about research can be encouraged only as it helps the student acquire research experience. Much of educational research was ~~is~~ superficial because it was done under adversity by persons who devoted relatively little of their lives to research. This was in decided contrast with academic areas where the researcher devote~~s~~d most of his lifetime to inquiry and development of new principles.

Just as the amateur ceased to play a role in the development of knowledge in physical and biological sciences, so too he must cease to play a major role in education if systematic knowledge of educational processes and products is to be developed. Books may help a beginner avoid some pitfalls, obtain a survey of current activities and methodologies. They may help the student acquire some humility toward the task of obtaining new knowledge and thus realize that even mature researchers of long experience cannot necessarily produce at will. Again, it should be indicated, that the opinions expressed in the Addendum reflected quite accurately those of the participants in this phase of the present study.

Observations on Educational Research

One respondent drew an analogy between research in education and research in psychotherapy. Both presented a number of crucial variables, consequent difficulties of performing statistical analysis, and elusiveness of reliable measures for those variables.

Achievement must be assessed as being not merely the desired goals of the average administrator, faculty member, or college student but also as being for the good of the whole community. Making such assessments means essentially making moral value judgments of these attainments. Much research continues which employs criteria that would not survive five minutes of critical explicit disucssion.

Descriptive research in education is only a part of the story. The most interesting results in the field, from the point of view of social action, concern causal analysis.

Causation.

The belief of Russell, and others, that use of causation in science is a sign of immaturity was widely accepted among traditional philosophers of science of the period 1925 to 1955. Where used, it was considered a crutch with which the subject could limp to better days. Causation, although indeed minimal in theoretical physics where exhaustive and effective mathematical laws are available, is indispensable both in the application of advanced sciences, and in a formulation of the knowledge of the less theoretical sciences. In education no expectation of eventual development of abstract theories is appropriate. There is every reason to expect that large and respectable parts of science will continue to employ causal claims rather than precise systematized laws.

Cause: Fundamentally, a cause is a miniature explanation--not an incomplete explanation, but a small explanation. It is not to be taken as a sufficient condition, or a necessary condition, or as committing its user to a belief in determinism. Cause is an identifying, selecting, or focusing or differentiating notion, which operates somewhat as a premise in the analysis of deductive arguments. It can be understood only in the context of a particular inquiry, where the contrasts that it is used to educe can be understood; from a formal point of view, any one of 40 variables may be in the same position as far as a particular effect goes, but in the context of a particular inquiry one, and only one, of these may properly be called the cause. (It is thus a notion from pragmatics, rather than syntactics, to give it a proper place in the over-all field of logic.)

How is a distinction to be made between a causal connection and a mere correlation? Brodbeck, following Braithwaite, propose that the distinction lies in the answer to the question of whether the alleged connection can be deduced from some other law or laws: if it can, it is causal; if it cannot, it is a mere correlation. This is too simple. The question still remains of whether the laws from which it is deduced are themselves causal laws or correlational laws. A complete answer requires a study of the role of the connection in those theories. (usually tentative) which can be said to provide an explanation of them.

Sidney Hook has indicated that a single control study cannot demonstrate any placebo effect.

Evidence:

Authors often fail to recognize the simplest points about scientific evidence in a statistical field. The fact that 85 per cent of National Merit Scholars come from small families and that over 70 per cent are first-born is quoted as if it means something, without figures for the over-all population proportion in small families and the over-all population that is first-born.

By minimum acceptable research standards, 95 per cent of the work in the field of psychotherapy that is concerned with causal analysis is, by either theoretical or practical standards, invalid or trivial. In educational research the situation is no different. So far as descriptive work goes, the situation is better; but this is less interesting (Hook, 1959). One cannot apply anything one learns from descriptive research to the construction of theories or to the improvement of education without having some causal data with which to implement it. There is no need for educational researchers to feel inferior because of this situation, but they should feel dissatisfied."

Corresponding to this persistent lack of sensitivity to minimum standards of good evidence in a multivariable field, there is the persistent failure to face up to the problems arising from the fact that the application of educational theories has morally significant consequences. In guidance and counseling, (Wilkins and Perlmutter) authors make many philosophical assumptions both explicit and implicit but usually neither examine nor test them.

From the logician's point of view, gross deficiencies of self-awareness in educational research exist, although techniques are available for handling most of these difficulties. As long as those in education allow their own institutions to put out written and cinematographic propaganda which seeks support for higher education by arguing that the average income of graduates is so much higher than of non-graduates as to more than pay for education, (without adducing any grounds whatsoever for supposing that this connection is in fact a causal connection and is not due to higher income group of families of students)--so long will they fall short of achieving maturity in their own subject. This is an excellent example of an argument which is scientifically unsound and significantly immoral, since it encourages people to spend money on the basis of a belief which is not known to be well founded.

Issues:

Confusion of what constitutes an adequate definition persists. (Feigl, Scriven, Maxwell). It has been recognized that the significant terms of theoretical physics are not amenable to explicit definition, or to definition in any precise and condensed way. With this collapse of the idol about which most of the theology of operationism and reduction sentences was built, there has come a more realistic approach to definition. As Mandler and Kessen stress--there is only one important standard for good definitions-inter-user reliability in their use in a given vocal or empirical context. Important in the introduction of a new term is provision for adequate training in its use for the reader.

"Such training can be provided by giving many examples and some loose rules to serve as guidelines for the term's use. Loose should not be misunderstood. A good definition, that is, a good explanation of the meaning of a term, gives extremely high reliability in its use. Whenever this can be done by explicit simple definitions, then it should. But it should not be dismaying to discover that some theoretical concepts, new and old, have acquired too great a burden of meaning for any explicit definition to encompass. Here it must not be presumed that use of a single example (implicit definition) or a rough analogy will be adequate. If the introduction of the new term is to be justified, rather than the use of a concatenation of old ones, then it must be done properly, and this is a lengthy business."

"In educational research, as in the social sciences generally, there is still a pathetic tendency to identify the use of a jargon with the possession of a science. Terms such as consonance and dissonance in social psychology, model, meaningful, intellective, normative, methods, scale, role, motivation, cross-cultural, and action research are still used (in the special senses which are relevant to educational research) in sloppy, unilluminating, and irresponsible ways. It could be said that, outside of statistics, terms which have been introduced specifically for educational research have done more to confuse than to clarify. That such a cynical generalization should have validity ought to make those concerned think three times before introducing new terms or new senses of old terms.

Another area where logical analysis is appropriate is discussion of objectivity, prejudice, bias, and similar concepts (Gardiner, 1959). There is still a pervasive tendency to suppose that the existence of a causal explanation for everybody's beliefs means that there is not a rationally superior justification for some of those beliefs. This is the old fallacy of the sociology of knowledge, and its ghost should have been long since laid (Hampshire, 1959; Hook, 1958).

Discussion of brainwashing, subliminal perception, and motivation research in advertising psychology and psychopathology has important consequences for the thoughtful student of education. What distinguishes brainwashing from education? What is indoctrination? What is propaganda? To what extent are educators in fact supporting this kind of influencing procedure in their school system with ritual observance of allegiance, emphasis on peer-group attitudes as a criterion for social action, and the like? Analytical thinking on this kind of subject is still badly needed (Kinkead, 1959).

"Finally, careful investigation of the possibility and success of separate training in courses in logic, scientific method, critical thinking, and investigation of the extent to which such training transfers or generalizes to other fields is needed. Somehow it must be ensured that at a much earlier stage in their development, students become self-consciously aware of the process of education and its presuppositions and justifications, so that they will eventually be in a position to improve it in the many ways it stands in sore need of improvement."

Social Science and NSF:

Some of the early difficulties of social science are reflected in the Hearings of the National ~~Service~~ Science Foundation. The passage quoted reveals a pervasive attitude of the time. It is presented as another benchmark of the times.

"The following passage, spoken in the course of hearings on the functions of a National Science Foundation, states quite accurately the major premises of many statesmen and scientist-statesmen:

> Clarence Brown (Representative from Ohio): "There is a sort of an antipathy against social science, if I can sense the thought of my colleagues properly, that might make a difference in whether this legislation gets not only approval,

but prompt approval. I think we had better stick to fundamentals. There are all kinds of social scientists, and there is some question as to just how valuable some of their contributions to the public welfare might be."

Dr. Isaiah Bowman (President, Johns Hopkins University): "Your remarks, Congressman, are in effect a summary of the views of most of the scientists who testified before the Senate subcommittee."

Mr. Brown: "That is a very great compliment."

Dr. Bowman: "We do not think we are so learned. We are just average fellows doing a job."

Mr. Brown: "You are the experts upon whom we must rely."

Dr. Bowman: "It seems to me essentially unsound to put into a National Science Foundation a wide range of social questions upon which the people of America have not yet made up their minds."

Mr. Brown: "That is exactly the point of view which I have, that the average American just does not want some expert running round prying into his life and his personal affairs and deciding for him how he should live ... there would be a lot of short-haired women and long-haired men messing into everybody's personal affairs and lives, inquiring whether they love their wives or do not love them and so forth ..."

The remainder of the chapter summarizes discussion that was not directly related to the comments summarized within the addendum, but which are necessary to complete the report of what was said during the discussions.

Observations on Science:

The activity of science is largely conscious and in its conscious aspect is systematic rather than haphazard. It employs a method which involves observation, experiment, creative imagination, logic and luck. An important feature of science is that the results found by an individual can be communicated to and verified by others. Henry Margenau in discussing the raw stimuli of science, uses the concept of P-plane experience. (P is a protocol, or a tentative draft relating to intercourse with other people.) The P-plane is related to observations and, particularly in the early development of a science, exploration in the P-plane preoccupies scientists. In the course of time, the P-plane becomes more densely filled with observational facts.

At some stage an explorer takes a leap into the C-plane, the conceptual region lying above the plane of experience. Such a leap affords a different perspective of the plane of experience and permits, in varying degrees, the correlation of observed facts by conjunctive paths hitherto unseen. Extending Margenau's model, we may say that, with vision restricted to a fixed solid angle, the higher the leap into C-space the wider the field in the P-plane that our concept unifies.

A science tends to develop in recognizable steps: 1) we explore the P-plane inaccurately and without particular aim; 2) we make a tentative leap into the C-space; 3) if lucky, we land at a recognizable position in the P-plane and establish a tentative correlating concept; 4) we make a higher leap trying to jump to as yet uncharted territory in the P-plane and confirm or disconfirm our conceptual leap by further, planar observation. All of this involves observation, imagination, logic, and luck.

The P-plane is oversimplified. Enormous amounts of non-communicable material comprise the total picture from which we abstract the small residuum which makes up the communal P-plane of science. Whenever possible, whatever is subjectively observed is to be avoided, at least publicly: If you can't count, it doesn't count.

Operational Definitions.

Though we have senses of touch, taste, smell, hearing, and vision we try to reduce all observation to visual, and further to pointer readings. Many scientists are convinced that pointer readings plus mathematical formulation are the only goal of science. When so reduced we free, as far as possible, observations from subjectivity and what remains is eminently communicable. But we pay a high price, for what is not so reducible is excluded.

Progress in a given science is largely assessed by the extent to which pointer readings have replaced subjective human senses and emotion.

Confusion of Science and Technology:

Reality, extending Margenau's model, is a hyperspace comprising a large number of different planes of experience each with its associated conceptual space. Classically the mark of the educated man was that he had penetrated many of these regions: in the fashion of our times the mark of the learned man is that he deliberately limits himself to a particular region, invading neighboring areas only to the extent useful for his narrow purpose.

The person who explores in or close to the plane of public experience is a technician. The person who leaps into conceptual space is a scientist (or a poet, theologian, etc.) The person who relates one plane of public experience with another is a technologist. All three are needed to structure even one region of reality. Science is basically an activity that concerns labors of the technician, and the scientist and leaves out the technologist. There is a growing tendency to believe that if we feed enough experimental results to a computer then science will result. Nothing could be farther from the truth. The essential thing about any study is not merely the gathering of data, the accumulation of facts, but the scholars interpretation of what facts mean and how they fit together into a logical usable pattern.

Collections of facts are not science, they are the material out of which science can grow; they are only the raw material of science and sometimes they are not even that.

When our conceptions are clear and distinct, when our facts are dependable and sufficiently numerous, when the conceptions are suited to the nature of the facts, and applied to them so as to produce exact and universal accordance, we attain knowledge of a precise and comprehensive kind which we may call science.

A Model of the Research Process.

Invention of a new device or process is essentially a synthesis, a putting together of principles, relationships and facts. These building blocks of invention themselves all had to be discovered so long ago that they are taken for granted, such things as the wheel and the screw; such materials as iron and glass. Others are more recent, but new enough so that we realize that they have not always been available. Still others are so new that the public is not generally aware of them.

No matter how few or how many of these principles, relationships, and facts may be, one thing is certain: the invention could not have been made until they were all discovered.

In every invention there exists a key fact, the last to be discovered of all the facts, relationships and principles, that were necessary before the invention could be made. The date for discovery of this fact is the earliest date at which the invention could have been made.

Research is the process by which these principles, relationships, and facts are discovered. Without research invention must come to a stop, for there is a finite way in which a given body of knowledge can be applied. Stoppage would be gradual because it takes time for inventions to be made, but without research the rate of invention would decrease to zero.

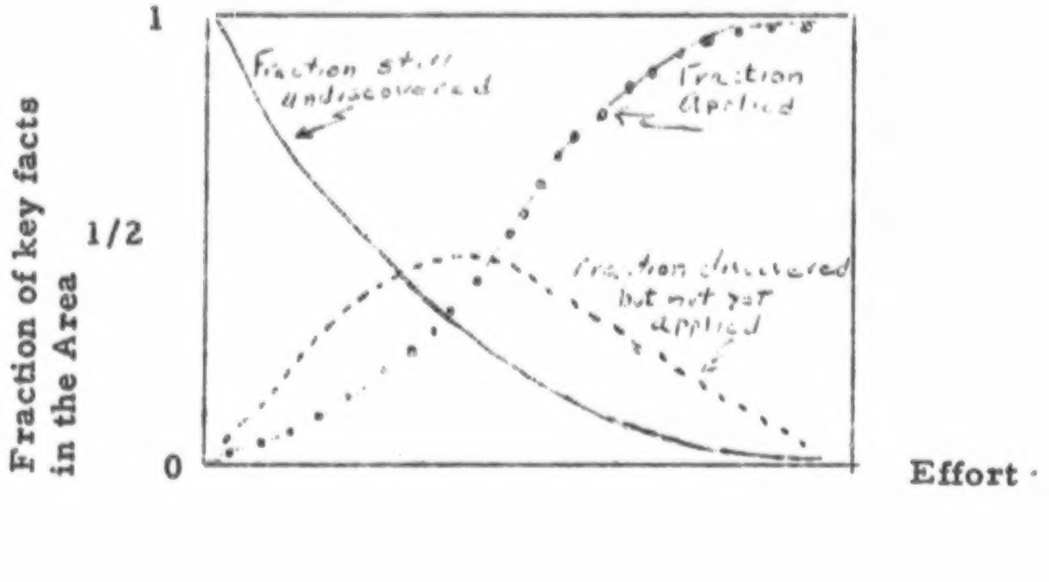
The number of facts required for an invention is usually very large, but only one is the key fact. Usually a key fact is the key in only one invention although it may be used in several. If the body of key facts is fixed the number of inventions is also fixed.

This can be symbolized by comparing it to a two-stage chemical reaction: $A \rightarrow B \rightarrow C$. Where A is the set of key facts not yet discovered, B is the set of key facts discovered, and C is the set of applications.

The first step is the research process of finding the key facts. The second is the process of invention. The rate of the first step is proportional to the effort put into the process and to the number of undiscovered facts. Rate for the second step should be proportional to the effort put into it, and to the number of pertinent discovered, but unapplied, facts. Thus, the rate should be of the form $\cancel{K}_1^{k} E_1 A$ for the first step; and $\cancel{K}_2^{k} E_2 B$ for the second, where E_1 and E_2 are the respective efforts and k_1 and k_2 are measures of the relative ease with which the processes can be carried out.

To find the proper balance of effort between these two steps, it is necessary to find a way of determining k's. One approach is through experience. Suppose that during the development of a field the effort put into each is held at a constant ratio. It follows that the number of facts in the three categories should change as shown:

Chart VIII. A TYPICAL HISTORY OF THE RESEARCH PROCESS



If it were possible to observe all three of these curves the analysis would be quite simple. But these data are not easy to obtain. The only data that were found were a few cases which gave only the C curve. These few were in excellent agreement with the prediction from this theory. Also, they indicate a ratio of $k_1 : k_2$ that approaches 2. In other words, it appears about twice as easy to discover a fact as to apply it.

While it is risky to apply this ratio generally, data suggest that ~~the case~~ this case (k - factors) are at least in the same order of magnitude. If so, it is possible to study the problem of the correct distribution of effort between the two steps.

The general situation is shown in chart IX below. Each curve shows how the total result (number of inventions) changes as other distribution of effort between basic research and applied research and development is varied. If the total effort is small, the best result is obtained when the two efforts are equal.

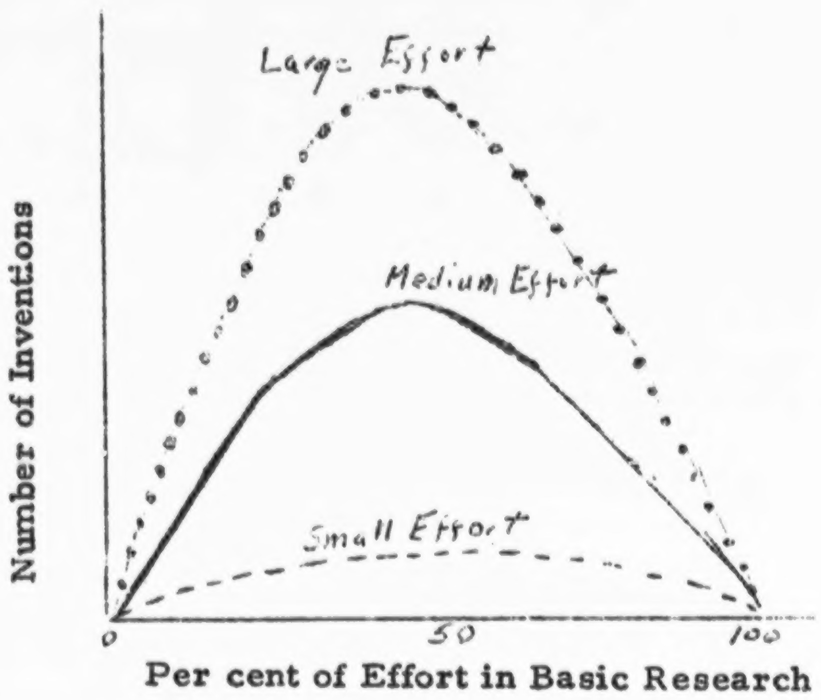


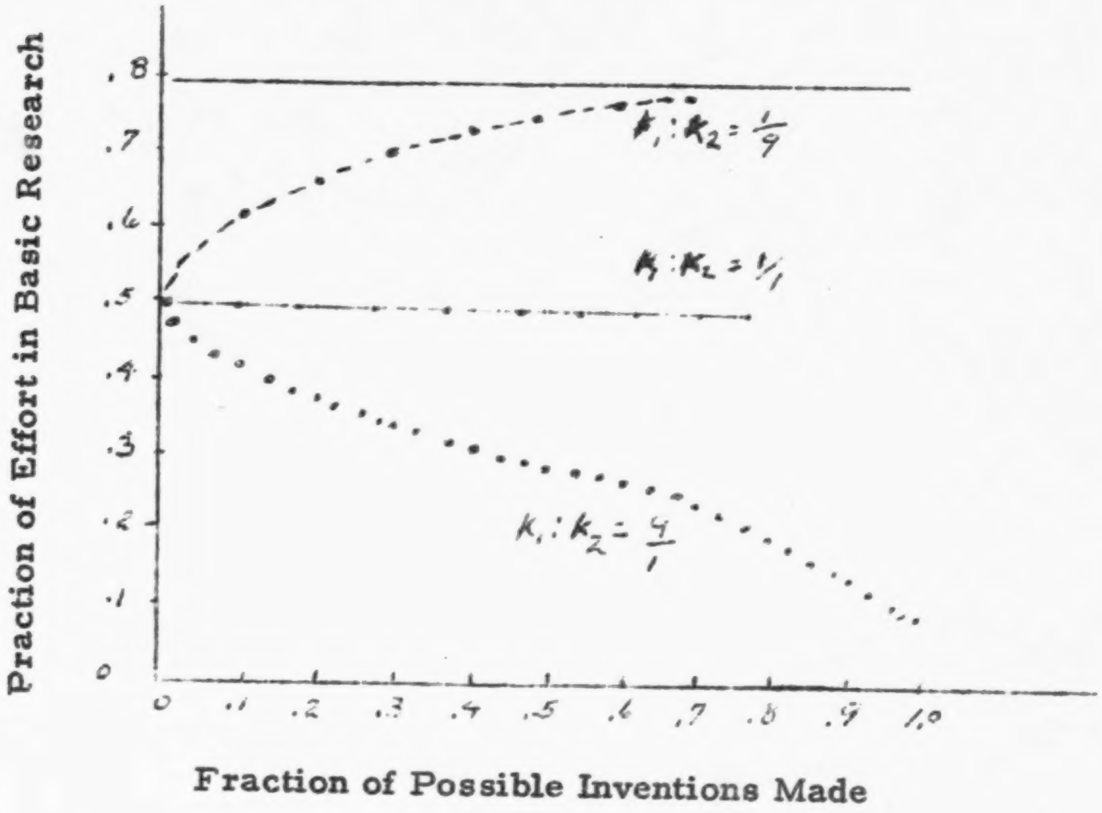
Chart IX. Relation Between Per Cent of Effort In Basic Research And Number Of Inventions

As the total effort increased, the position of the maximum shifted. How this shift takes place is determined by the ease factors, k. The curves on the preceding page are drawn for the case where $k_1 > k_2$. Here the shift is toward less basic and more applied research.

The last chart shows the shifts in detail. The curve shows the way that the optimal distribution of effort changes as the total effort is increased. The changes are plotted for three cases: $k_2 = 9k_1$, $k_1 = k_2$, $k_1 = 9k_2$.

If present indications are dependable, the ratio of $k_1 : k_2$ approaches 2. If this is so, the optimal fraction of basic research in a large program to develop a field should be around 30 per cent.

Chart X. Fraction Of Possible Inventions Made To That Of Effort In Basic Research



Some Observations on Research.

There are at least two essential identifiable stages to research activity - the creative or idea stage, and the verifying stage. The research training of educational researchers is almost exclusively devoted to the verifying stage. Courses deal with work in statistics, design of experiment, and measurement usually at the technician or user's level. When the first stage of research, is neglected we must rely upon a false notion of the "happy accident" concept to generate productive ideas. Historically, science did not make significant progress until it was able to generalize its concepts and to tie them together. From a framework of assumptions certain propositions were derived, some of which could be subjected to empirical test. The iterative process of revising logically organized propositions, in terms of empirical tests of their consequences, has led to the development of dependable and useful knowledge. The extended quotations from Poincare's Science and Method summarize this beautifully:

> There is a hierarchy of facts. Some are without any positive bearing, and teach us nothing but themselves. The scientist who ascertains them learns nothing but facts, and becomes no better able to foresee new facts. Such facts, it seems, occur but once and are not destined to be repeated. There are, on the other hand, facts that give a large return, each of which teaches us a new law. And since he is obliged to make a selection, it is to these latter facts that the scientist must devote himself.
>
> The facts that give but a small return are complex facts, upon which a multiplicity of circumstances exercise an appreciable influence--circumstances so numerous and so diverse we cannot distinguish them all. But I should say, rather, that they are facts that we consider complex, because the entanglement of these circumstances exceed our compass of mind.
>
> "..The isolated fact attracts the attention of all..but what the true scientist can see is the link that unites several facts which have a deep but hidden analogy." ...Facts would be barren if there were not minds capable of selecting between them and distinguishing those which have something hidden behind them and recognize what is hidden...minds which behind the bare fact, can detect the soul of fact.
>
> Mathematicians attach great importance to the elegance of their methods and of their results, and this is not mere diletantism. What is it that gives us the feeling of elegance in a solution or demonstration? It is the harmony of the different parts, their symmetry, and their happy adjustment; it is, in a word, all that introduces order, all

that gives them unity, that enables us to obtain a clear comprehension of the whole as well as of the parts. But that is also precisely what causes it to give a large return; and in fact the more we see this whole clearly and at a simple glance, the better we shall perceive the analogies with other neighboring objects, and consequently the better chance we shall have of guessing the possible generalizations."

It is for the same reason that, when a somewhat lengthy calculation has conducted us to some simple and striking result, we are not satisfied until we have shown that we might have foreseen, if not the whole result, at least some of its characteristic features. Why is this? What is it that prevents our being contented with a calculation which has taught us apparently all that we wished to know. The reason is that, in analogous cases, the lengthy calculation might not be able to be used again, while this is not true of the reasoning, often semi-intuitive, which might have enabled us to foresee the result. This reasoning being short, we can see all the parts at a single glance, so that we perceive immediately what must be changed to adapt it to all the problems of a similar nature that may be presented. And since it enables us to foresee whether the solution to these problems will be simple, it shows us at least whether the calculation is worth undertaking.

What I have just said is sufficient to show how vain it would be to attempt to replace the mathematician's free intuition by a mechanical process of any kind. In order to obtain a result having any real value, it is not enough to grind out calculations, or to have a machine for putting things in order; it is not order only, but unexpected order, that has a value. A machine can take hold of the bare fact, but the soul of the fact will always escape it...

It is economy of thought that we should aim at, and therefore, it is not sufficient to give models to be copied. We must enable those that come after us to do without the models, and not to repeat a previous reasoning, but summarize it in a few lines..."

A Brief Survey of the Present State of Educational Research.

No one seems to know precisely what educational research is, and how one can unerringly distinguish it from other related activities. In fact, a common refuge is to say that it is whatever educational researchers do. If so, then the continuum of reswarch in education ranges from the level of clerical work involving numerical data to that of sophisticated theory development and inquiry. Perhaps certain points may be identified and placed in a hierarchy using Poincare's criteria:

(1) School censuses, budgets, testing and scoring of papers, school surveys that involve tabulation of numerical information with little more than interpretation of the obvious outcomes.

(2) Action research or demonstration of practice without any attempt at appraisal beyond fortuitous observation or impressions of the movement. Anecdotal records, unstructured cases, histories and the like might also be mentioned.

(3) Studies of a practice or educational phenomena involving rudiments of design such as intact-but undefined control and experimental groups, standardized tests, pre- and post-testing. Manipulative statistical studies or opportunistic statistical hypothesis hunting including routine facts analyses and similar routines that lead to no particular generalizations might be included here since they deal with a comparatively undefined problem.

(4) Studies of a practice or a phenomenon dealing with a defined problem which generates alternative hypotheses that permit a test of significance. Multivariate statistical analyses dealing with a defined problem.

(5) Studies of a practice or phenomenon dealing with a clearly defined problem. This level differs from the preceding in the extent of refinement of the definition of the problem, checks for logical consistency within the framework and of the generated hypotheses applied prior to definition and selection of groups for empirical comparison, and the specified empirical test identification of features and the specific empirical tests that constitute the basis of relevance to the problem, selection of measures, selection of the hypothesis testing strategy in relation to these relevant features, rigorous experimental control, appropriate and accurate analysis of the data. This stage is the first in the sequence directed toward developing a background of organized knowledge of the practice or phenomenon.

(6) Studies that are based upon 5 and go beyond it. Prior and significant attention has been devoted to identification of assumptions and postulates, arranging these in a systematic form, checking for logical consistency, hypotheses for testing are generated as consequences of logical operations within the prescribed framework. Selection of appropriate subjects and circumstances for testing the hypotheses are improved because features of their relevance to the background is clearer. Such clarification permits improvement in the data collected through development of instrumentation and improvement of measurements. The statistical or verifying phases of inquiry probably do not differ appreciably from (5) except that if no appropriate strategy exists in published form, the investigators can have it developed.

Publications of educational researchers, exhibit greatest frequency at level 3, a few might be called level 4, almost none at level 5, and none at level 6. In professional journals, levels 1 and 2 are still relatively frequent, as they probably should be if data for school operation are to be available. While these data are essential locally, it is debatable whether they have general utility.

For education to have a body of knowledge that is timely, useful and dependable all levels of activity are essential. In the past, and at present, activity has been concentrated at the first three levels. Vannevar Bush in 1946 indicated that when firemen are kept busy putting out fires there isn't much time available for the study of fire prevention. For many reasons, education has had insufficient funds, hence insufficient effort, devoted to research activity. In a large measure this may be due to the prevailing philosophy that if a person is not actually facing a class teaching, he was wasting his time. Time for planning of lessons, for preparation of audio-visual materials, for scoring examination papers, typically must come from the out-of-school or unreimbursed time of teachers. This might be described as the iceberg misconception of teaching--that only the visible activity is important. This myth is furthered by administrators, supervisors, and boards who insist upon assessing the quality of teaching, almost exclusively, in terms of the visible classroom performance of teachers. The exclusive use of measuring devices, rating scales, and observations that neglect the large invisible segment of teaching performance are not in the best interests of the pupils, the public or the profession. Recent applications of programmed learning are suggestive of the improvements possible through attention to the quality of materials presented as well as to their visible presentation. There is much more to medicine than taking temperature, blood pressure, stethescope, or electrocardiograph readings. There is much more to teaching than standing up before a class and doing something.

To be sure the educational enterprise involves much more than teachers. It requires buildings, instructional materials and facilities including laboratories, an organization within a social-economic context, both public and private funds, goals and purposes, and many kinds of people--ad-ministrators, counselors, reading specialists, deans, presidents, clerks, and assistants, etc. All of these lead to an enormously complicated enterprise. This enterprise has been studied much like the blind men studied the elephant, and some critics have unkindly added, with as much success.

Conventional preparation for educational research has been largely given in courses listed separately at the graduate level and consists usually of a course in: routine statistical analysis, introduction to educational research and a course in measurement. One is reminded of Norbert Weiner's comment:

> If the difficulty of a physiological problem is mathematical in nature, then ten physiologists ignorant of mathematics will get precisely as far as one physiologist ignorant of mathematics, no further.

It would be wrong to conclude that educational research has been ineffectual. Education today differs from that of a generation ago largely because of educational research activity, but research at levels 1 to 3 was geared to a pace of slow and gradual change. The result, in a rapidly changing world, is too little and too late.

New Patterns Needed to Keep Up with Demands.

Suggestions for new patterns in educational research perhaps may be obtained by judicious exploration of older better established fields of research in relation to demands of modern times, e.g. the space sciences. Among these research is done as basic research, applied research, development and production. Basic research is research directed toward the increase of knowledge in science where the aim of the investigator is fuller knowledge of the subject. Effective basic research requires much more than the interrogation of nature through theoretical and experimental study to discover new facts. As Poincaré indicated, it involves ordering these facts into a pattern and communicating them clearly to others. Communication is achieved through papers published in scientific journals. Since most of these papers are highly complex, difficult to read, and their significance grasped by only a few scientists, they seldom are noticed in the popular press. Yet these are the very building blocks, the new scientific knowledge, from which come advances. These advances generally require some years to develop.

Basic research must be followed by equally important applied research, development and production phases before their full potential is realized. By this time there is a tendency to forget the basic research that made the entire advance possible in the first place. It's significance, difficult to recognize when first recorded in scientific papers, is furthur dimmed by time. Even the men who did the basic research may be interested in something else in a different location.

Basic research progress takes place in spurts or jumps, now popularly called breakthroughs . These spurts are unpredictable. While most spring from soil well worked over, some are accidental. Following the spurt there is usually a period of decreasing rate of progress until another spurt occurs.

Another way of looking at each spurt is that it opens up a new field of research. This field consists of a large number of facts connected by some relationship to each other. While anyone of the facts in the new field might have been discovered accidentally, it is typical that until the spurt no one thought of looking for them or thought it worth the effort to look. But once the field opens up people realize in a vague way that the facts are there and basic research is performed to find them. Knowledge is pursued for the sake of understanding and thoughts of application are usually latent. When Gladstone asked Faraday what was the use of his work on the new field of electricity Faraday replied, What is the use of babies? They grow up.

After basic research has been carried out for a time, the known facts begin to suggest that certain applications might be possible, especially if suspected, but undiscovered, facts exist nearby. This is the origin of applied research which is impossible without the basic research that precedes it. Because it has a definite application in mind applied research tends to concentrate in limited areas. By such concentrated effort it can proceed more rapidly. Basic research, which tends to explore the entire field, is more likely to find the fact which suggests a new application, or to discover a theory which immediately orders all the facts in the field into a pattern which then make apparent numerous applications. Overall concepts of this nature often involve understanding and assembling facts from several other fields of science.

Problems of Increasing Research.

Research cannot be turned on and off without producing disruptive effects on the program and organization. Some conditions necessary for a productive research program include the following:

1. Availability of scientific manpower. Counting papers in selected journals indicates who is performing research. In a study Basic Research in the Navy, at the Arthur D. Little Co. indicates that only 20 - 30 per cent of all physicists and chemists who obtain the doctorate publish research papers after their thesis. Studies of physicists earning doctorates in 1936, 1941, 1946, and 1951 indicate that Fellows of Physical Society publish at a rate ten times that of non-Fellows, and members of the National Academy of Sciences at about twice the rate of Fellows. In education the per cent of doctorates publishing research is less and the proportion of publications done by the same people greater. The attached table indicates distribution of publications by institutions.

An obvious action would seem to have more scientists trained and motivated toward basic research. One way to extend the work of basic scientists is to provide them with better equipment and more technical assistants. Whether to try to motivate more persons interested in graduate work to shift is debatable. There has been no change in the rate of science doctorates to other doctorates granted since 1932. Many feel that the relationship is satisfactory -- 30 per cent physical science, 20 per cent life sciences and 50 per cent other sciences.

2. Training. In upgrading educational research, the first suggestion might be that it be brought into line with the training of other scientists. Several schools are attempting this, notably Wisconsin, Harvard and Minnesota. The recent doctorate in communication sciences at Carnegie Institute of Technology may lead toward the development of more creative basic scientists for education. Such a program would differ significantly from the present one.

a. Training includes greater depth in a scientific discipline and in analytic methods. Training in analytic methods would include much more than one or two courses in applied statistics. For example, exposure to computer utilization and programming for both numerical and logical analysis would be useful. In research for education training in analysis of logical relationships on computers directed toward development of educational theory in terms of computer programs appears to be more important than numerical analysis alone. Such computer models can be used to generate interesting hypotheses and testing of these results by empirical studies. Courses in numerical analysis should leave sufficient depth to permit reading of professional statistical journals such as the Annals of Mathematical Statistics.

b. Studies of the school enterprise as a system using systems analysis procedures and strategies. Education includes a wide variety of persons -- teachers, librarians, counselors, speech therapists, textbook writers, audio-visual specialists, supervisors, principals, superintendents, deans, presidents, trustees, school board members. Education also includes a wide variety of functions, teaching and remedial training, curriculum development, administration, finance, public relations. It includes many kinds of learning, motor skills, social skills, verbal knowledge, interests, attitudes, understandings, values, and habits of health, safety, work and recreation. Study of these aspects requires an inter-disciplinary approval by people who are as competent as their counterparts in the academic disciplines. The commitment of these people would be to the education enterprise rather than their discipline.

Study of mastery of academic knowledge calls for fewer resources than study of the complex operation of schools, so we have many studies of reading but few of operations research.

Research has been piecemeal. A segment of a problem is studied more or less in isolation under controlled conditions. Thus, in the field of learning theory is based on the simplest types of learning, usually in sub-human species. It proceeds on the hope that its findings will be helpful or applicable in connection with significant problems of human learning. Investigators who proceed with scientific rigor in their specialty, do not hesitate to project their conclusions from pigeons to pupils. The evolutionary and psychological leap here is indeed great.

Such projection can as easily distort and misguide as advance understanding of human learning. If the classroom could be studied as easily as animal learning we would have more classroom studies. Thus, the attraction of learning theory appears to derive from its accessibility to experimental investigation rather than from its intrinsic validity in relation to human learning. In the disciplines of of operations research and systems analysis there exists a body of knowledge and research strategy that permits study of complex operations. Applications of notable success have been made in various branches of engineering, business and industry, and military research. Education cannot use this knowledge because it does not have persons familiar with the language and concepts of this area.

3. Organization: Complex problems require research on a larger scale, extending beyond the resources, interests, abilities, or lifetime of one individual. Universities and educational institutions have generally demonstrated an unwillingness or inability to provide either the facilities, funds, or climate for research in education to anywhere near the extent they have for other disciplines. Maximum progress and return for funds expended would seem to come from institutes. Development of independent research centers or institutes would permit a large-scale, long-term organization theory approach to educational problems. Such institutes could recruit personnel from related disciplines, provide a strongly supportive educational research climate, and make a truly interdisciplinary attack on educational problems. Some of these institutes could be devoted to basic research in education. Others could be concerned with applied research and development. In the physical sciences, the Arthur D. Little Company has found that application requires two or more times as much effort, time, and funds as the basic discovery did in the first place. In education we expect the applications to be made automatically. The recent establishment of project English, the proposed establishment of projects Social Studies and Teacher Education would seem to be in desirable directions.

Unfortunately their prognosis is not entirely good. Project English seems to have a vastly devalued notion of what constitutes research. Unless better research persons are recruited, results may be disappointing in terms of applied research and development as well as in terms of basic research achievements.

The establishment of an institute for measurement, and one for the study of education in terms of modern organization theory would be very useful. An institute concerned with information handling aspects of the educational process also would be desirable. To be sure education is much more but present technology gives us a means of rigorous control of information handling and for development of logical schemes or theories for organizing knowledge. Such an institute would explore the relationship between tactics of media and materials production and subsequent learning activities of individuals. We need to understand the kinetics of inter-action, and to be able to match our instructional materials and resources, our instructionsl strategies with abilities of students in order to maximize attainment of objectives.

Strategies and tactics of a changing profession, which is inevitable in a changing world, require attention. Much professional time and energy is wasted in fighting misunderstood change. Research on opening of minds may be helpful. The man-machine educational system of the future will require different forms of interactive situations between teachers and pupils, materials and instructional strategies, facilities and personnel. An institute which would investigate possibilities of new institutional frameworks that modern technology may allow us to invent in education seems desirable. In order to avoid costly mistakes, it is necessary to optimize both quantitatively the variables of such institutional frameworks. Optimization requires checking of alternatives against operational realities by means of appropriate models or simulation processes. These techniques are commonly used by the RAND corporation, Arthur D. Little Co., or Lincoln Laboratory. They are also currently used by business and industry in studying the impact of possible innovations on their organization. Business can thus select for implementation the best combinations of features and adjustments to reality can be made without many costly errors. Such exploration requires command of the systems approach that is current among mathematicians, engineers, physical scientists, and operations researchers, but is so far not available to education.

4. Support: It is unlikely that educational research will receive a fair share of either local school funds or of university funds. In any case the resources available are too limited for the task at hand. Such efforts can only be properly supported on a federal or national scale.

In 1960 there were almost fifty million pupils, two million teachers and about 25 billion dollars of national resources invested in public education. The amount spent for educational research was less than one-tenth of one per cent. For research and development the U. S. office of Education had about one per cent of the amount available to the Public Health Service. The amount was less than that spent by the Forest Service, Commercial Fisheries, or the Bureau of Sport Fisheries and Wildlife.

At the state levels the situation was even worse. In 1957, only 14 states had more than one professional person in the state education agency devoting full time to research, and these were gathering and tabulating state statistics for administrative purposes. At the local school district level financial support for research is virtually nonexistent. In some of the larger cities there are often diversions of research, but the emphasis is still on administrative fact gathering.

In the past the primary support of research has been the universities and colleges usually in terms of reduced teaching loads, and sometimes very limited financial assistance.

The tradition of intellectual inquiry in education has not been very pervasive. Universities granting the doctorate have typically devoted their funds to public service and public relations rather than research. The tradition of research as an integral part of graduate work in education simply does not exist outside of less than ten per cent of the institutions granting the doctorate. This tradition includes a history of competence in research on educational problems. It is evidenced by a willingness of all units of the institution to accept and support continuing inquiry into educational problems. It is evidenced by scholarly publications of the faculty, strong graduate programs in educational research, outstanding graduate students, willingness of various disciplines to cooperate in studies of educational problems, availability of a wide range of subjects, classrooms, and schools for experimentation, availability of consultants, availability of related technical and scientific facilities.

Foundations similarly have not devoted sizable funds to research in education. Current foundation support seems to be available in large amounts only for projects having considerable public visibility and publicity value. Sizable support seems to be available only for demonstration of a practice that it is desired to popularize. In other words, foundations currently do not seriously support educational research.

No other field can match this record. Industry would be bankrupt, agriculture would still require most of our population to produce just enough to eat, and national defense would be a farce if research and development were at the same level as in education.

A climate of understanding and support of research within the profession and its organizations is important. Such a climate is the responsibility of professional organizations as well as of the colleges and universities. If evasion of that responsibility is continued by educational organizations, it might be well for other professional institutions to assume it.

Technology and Education

Technology is so much a part of education that education could not exist as we know it otherwise. Many hundreds of millions of dollars are spent annually in laboratory equipment, audio-visual supplies and materials, instructional equipment and material, language laboratories, ...

Technology is very much a part of education, but its full potential is yet to be realized. The view of educators is rather close to that of laymen--Technology is regarded as a matter of hardware.

For this discussion technology includes both the hardware of civilization and the associated knowledge and understanding that is relevant to the development and exploitation of the hardward. To be sure technical processes and knowledge frequently result in hardware. Since hardware is tangible and obvious it is frequently seized upon by the uninformed as the culmination of the search for knowledge. And it is quite obvious why this is so. No special training or understanding is needed to see hardware. The illusion of knowledge is easily projected. In order to comprehend the relevant knowledge that undergirds hardware years of experience and training are often required. Abstract concepts and specialized language--mathematical, logical as well as knowledge of the development must be mastered usually over a period of years. It is so much easier and more comfortable to deal in science fiction.

Technology is a way of life. It has been a way of life in developed countries ever since the Industrial Revolution began. It is a way of life imposed upon us by conditions in the world in which we live--the large and ever-increasing population, the exhaustion of natural resources, especially fossil fuels, the demands for more of the world's goods by those in under developed nations. If technology were to cease, within one month a large segment of our population would cease. A hunting economy, or even a purely agricultural, cannot support many people.

These points have been well documented by Harrison Brown in his volume, Man's Future.

The primitive prototype of the modern scholar noted relations among phenomena and saw similarities and differences in the structure and appearance of plants and animals. When he tried to clarify this picture, his desire for understanding had at first to be satisfied with assumptions about mysterious forces having no counterpart in his experience. With improved observation and improving logic came improving intellectual developments. So long as intellect was centered on exercises in logic, as among Greek Scientists, the infancy of science persisted. While the Greek idea said that theory should fit observation, no one seems to have thought of experiment to relate theory and fact. Also physical work and craftsmanship were disdained as the work of slaves.

The more modern approach is exemplified by Galileo: 1) logic, especially mathematical, 2) theory must lead to agreement with observation, thus adding the missing ingredient. Experiment was not mere observation of passing events but the deliberate shaping of events to observe for definite purposes. Galileo also was an accomplished craftsman (designed and constructed the telescope, thermometer, pendulum, clock) and was skilled in using his instruments.

Galileo practiced the idea that experiment was the test of theory, hence the need for tools of experiments. The interaction between theory and experiment, like the feedback in a regenerative circuit produced a stupendous rise in man's comprehension of nature. Availability of tools had a far-reaching effect on the state of knowledge.

Anyone must be greatly impressed, if not overwhelmed, by the increasing multitude of instruments for all conceivable purposes today. There seems to be little left to invent or design. Yet this fact does not imply that further progress is not to be expected. The need for instruments in space exploration and the study of atomic structures is quite evident. Unfortunately the need is not quite so evident relative to human behavior.

To be useful, information must be factual, numerical, specifically descriptive, hence information obtainable mostly by instruments.

We take for granted that the utility of instruments depends upon availability of auxiliary devices and supplies whose mere listing would form a huge catalog of apparatus and supplies. Most research depends profoundly on instruments. Not until an idea has been advanced and developed by logic into a theory, and theory has been subjected to searching experiment, can it attain status. And not until experiment has been independently repeated and the results confirmed repeatedly can theory become assimilated in the body of knowledge. Ideas are forged into theories by logic; theories are tried and tested by experiment.

Among the 138 Nobel laureates in physics and chemistry, 1901-1960, 112 received the award for research in which instruments were dominant. In the other 26 instances of theoretical work the theories became established through successful verification by experiment. Conversely, theory was of key importance in the work of the 112 who were distinguished for experimental insight. No dichotomy between theory and experiment appears evident. Without their interaction there is no research.

But to return to potential contributions of technology to education it is suggested that at their worst such contributions would remain focussed on hardware, and at their best on the developments necessary to develop and use instruments effectively, hence the development of a nature science.

Education is a complex enterprise and not an empty tautology as much of the literature might imply. The enterprise suffers at every turn from the tendency toward superficial answers to superficial questions, and the neglect of difficult questions is well-known. Scriven suggested that very few results in educational research could stand more than five minutes of critical exploration.

The potential of technology for education is to introduce greater clarity into thinking about educational problems:

a. Through restriction of the field rather than attempting to do all things for all people.
b. Through clarification of antecedent--consequent relationships.
c. Through exploration of ideas relevant to instruction, learning, adjustment, etc. in a more realistic fashion than is possible by the unaided senses, or pencil-paper means of data collection.
d. Through relating goals and instrumental responses necessary to attain goals.

Computers represent only one of the functions that can be performed by instruments. This is an important part and the development has generated a lot of excitement. It is hoped that as a result other functions will not be neglected. Also under the glamorous spell of computers, it is hoped that commitment to education will not be forsaken for a commitment to computer use *per se.*

I would like to repeat that education is a complex enterprise, and that it involves among many other things:

1) Goals, intent, or commitments. Usually we get a strange mixture of implicit value judgments and objectives here.
2) Facilities and resources - personnel, buildings, libraries, text and other instructional materials, finances.
3) Activities and behaviors related in certain ways to a servo loop analogy of the communication process; a sort of input-output-feedback set of relationships. Instrumental responses of students and teachers involved in these behaviors remain unknown territory.
4) Quality control processes which are still largely in pencil-paper stage.

Potential might be increased by:

1. Upgrading requirements for educational practitioners and researchers, to make it equivalent to that of people in behavioral sciences.

2. Long range support of interdisciplinary groups such as the SDC and similar groups at universities that can assemble the critical number of qualified people to make rapid strides in an area.

3. More emphasis on quality of performance, less on quantity; critical appraisal and development of dependable systematic knowledge.

4. More funds. A professional organization that will indicate that bargain basement education is not adequate for today's needs.

5. More specialization within a supportive intellectual climate. A specialist needs people to talk with both in his own specialty as well as related specialties, but this should not be attained at expense of individual autonomy.

6. More emphasis upon training in physical and biological sciences. Education should have some people accepted on an equal scholarly level by those who are in these disciplines. The only difference should be a commitment to education rather than metallurgy, economics, mathematics, neurology, ... There should be no difference in scholarly attainment or capability.

7. Undergraduate training that is disciplined and rigorous; designed to acquire skills of the scholar rather than the technician. Specialiaation could take place at masters or doctoral level.

Potential for Education:

1. Free teacher of routines, low ability level activities. Free to devote time and energy to prfessional level activities. Increased technology does not mean more time for rest or golf but rather technology provides time and facilities for becoming more perceptive, more thoroughly informed, and more sensitive to differences in educating people that make a difference.

2. Free researcher of tedious detail and tedium of repetitive tasks, hence permit him to follow a problem in terms of its own logical and experimental requirements.

3. Enlighten administration or management by supplying knowledge and rational decision processes in place of guessing and free wheeling hunches.

4. Inform researchers and teachers about developments in their field by means of adequate information storage and retrieval processes.

Cautions:

1. Don't expect miracles. Failure is more common than success. There are far more " dusters than gushers" in science than in exploration for oil.

2. Inventions and improvements are not readily predictable over a long time span. If a major project had been proposed in 1850 for improving lighting, we would probably have had better designed mantles, various mixing chambers and jets, ... No fool would be wasting his time with incandescent wires in a glass bulb.

Significant invention usually represents a radical departure from previous custom and tradition. Pasteur was a chemist in a brewery not a medical researcher.

Investion occurs whenever the last essential fact or knowledge necessary for the invention has been discovered. This has often led to repeaded simultaneity of invention and to conflicting claims as to priority. Some one has said that this is an example of "What one fool can do, another can."

3. Development of technology is costly. Encompasses both basic understanding as well as application. Difficulties in application have often come about through lack of basic understanding. A common cliche is that we have a great deal of understanding about (say the basic learning process) but we fail to apply it. We need a conference to inform practitioners about this. The Arthus D. Little Company found that it cost several times as much to develop applications of a basic discovery as to make the discovery in the first place. In education we expect the application to be almost automatic.

4. Don't become infatuated with the gadget and forget alternative procedures. During World War I the English mathematician, Tocher, was given a problem in computing trajectories for new projectiles. The only way he saw to solve the complex problem was to construct an elaborate analog computer. Supplies, materials, building facilities and men were assembled and put to work for six months. One night the building burned down and everything was lost. In despair Tocher sat down and started working at his desk. Within a few hours he had completely solved the problem!

Summary

Education is a complex enterprise and not an empty tautology as much of the literature might imply. The enterprise suffers at every turn from the tendency toward superficial answers to superficial questions, and the neglect of the difficult is too well known to comment. One commentator indicated that very few results in education could stand more than five minutes of critical exploration.

Education is a complex enterprise, and it involves among many other things: 1) Goals, intent, or commitment to something. Usually we get a strange mixture of implicit value judgments and assumptions without clear specification of intent. 2) Facilities and resources--personnel, libraries, buildings, instructional materials, and finance. 3) Actions and behaviors relating (2) and (1) in a variety of ways. A servo look analogy of the relationships, e.g., input-output feedback relationships deserve attention. Instrumental responses of students and teachers involved in these behaviors. remain unknown territory, although efforts, supported by USOE, by Smith, Konnin, Barker, Gump, F Flanders, and others are a step in this direction. 4) Quality control or evaluation processes. Still in exploratory stage despite extensive work in test development and test theory. Cronbach and Gleser point to type of study needed to develop quality control processes for education.

Potential of educational research might be increased by:

1. Upgrading requirements for educational practitioners and researchers to make them equivalent to those of people in the behavioral sciences. Invokes concern with the content of education.

2. More emphasis on quality of performance, less on quantity. Critical appraisal of the knowledge to sift and what is dependable.

3. Long range support of interdisciplinary efforts and groups that include a critical number of people. Above the minimum necessary to obtain a catalytic reaction.

4. More funds. Education costs money. There are no bargains. Bargain education, like other bargains, is often shoddy. Professional organizations need to reveal facts of life to their members and the public.

5. More specialization within a supportive intellectual climate. Specialist needs people to talk with both in his own specialty and general areas. Need not be attained at less of individual autonomy. As knowledge increases specialization increases. The generalist while useful as an administrator is not likely to be able to push back the boundaries of knowledge

6. More emphasis on training in physical and biological sciences. People should gain sufficient competence to be accepted on equal level by colleagues in these disciplines.

7. Undergraduate training should be rigorous, emphasize scholarship and inquiry, rather than generalist training. Should be designed to acquire skills of the scholar rather than the technician. Specialization should come at the graduate level. Enlightened practice requires inquiry and he who would remain competent must be able to comprehend results of inquiry.

Related Inquiries:

Discussions about educational research have never been in short supply. Interested organizations included the Organization for Research in Education combined through the efforts of Randall Whaley of the National Academy of Sciences, the Council for Research in Education, an outgrowth of the efforts of P. M. Symonds and A. E. R. A. The military organizations--Air Force, Army, and Navy--had large and active organizations for the performance of educational research.

The NSE, AAAS, NRC-NAS, Sigma Xi, APA and SSRC, as well as the ACS, various engineering organizations (Journal of Engineering Education, Journal of Chemical Education) were not quite within the province of the public school educational establishment. AERA and Phi Delta Kappa were expressing increasing concern about the level and amount of educational research. The main educational establishment, of the National Education Establishment and the Office of Education went blithely on their way, ignoring research. In fact for several years AERA and the NEA establishment did nothing about testifying about educational research needs because it might jeopardize their tax exemption status. Establishment and support of a research branch in the Office of Education was achieved when Dr. S. M. Brownell was Commissioner of the Office of Education. Opposition with the office itself was pronounced. In fact after about two years of existence, there appeared to be a concerted effort by the established branches, to take over the new function of research because they sincerely felt the funds could better be used that way.

Various issues of the Review of Educational Research were, and still are, devoted to summarizing educational research and providing bibliographies. In fact, the December issues triennually ere devoted to research methodology--December, 1948, 1951, 1954, 1957, etc.

Ryans[1] and Walker[2] discussed the preparation of research workers and indicated that little beyond a course in general methodology and a course in statistics was required. The preparation of research workers was distinctly limited.

Ryans[3] discussed the question "Are educational research offices conducting research?" and came up with the answer essentially no. Activities of the offices set up for conducting educational research included in terms of rank order of frequency:

a. Services and acounting--pupil record keeping, preparation of budgets, preparation of salary schedules.
b. Supervisory activities--conduct of curriculum planning, guidance services, . . .
c. Conduct of public relations.
d. Demonstrations of practice.
e. Action research.
f. School surveys--community survey for a new school building, survey for a new bond issue, pupil testing survey using standardized tests, finances survey, . . .
g. Correlational studies--using results of testing programs to run all sorts of correlations with no discernible goal in mind except to accumulate correlations.
h. Educational rationalization--searching for and colletting only evidence favorable to a particular practice it was desired to push.
i. Experimental study--taht attempted to try out a practice by setting up hypotheses, selecting groups on which to try out the practice, pre and post testing, etc. These ranged in sophistication from relatively naive to reasonably sophisticated. Appeared to be in emerging trend, but a minor one at that. Phillips[4] showed that the situation was, if anything, even more aggravated in state departments of education. He found little evidence to indicate that they were conducting research.

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[1] Ryans, D. G. "The Preparation of Educational Research Workers," Journal of Educational Research 49:195-202, 1955.

[2] Walker, H. M. "Preparation of Research Workers in Education," Elementary School Journal 58:9-15, October 1957.

[3] Ryans, D. G. "Are Educational Research Offices Conducting Research?" Journal of Educational Research 51:173-84, November 1957.

[4] Phillips, B. N. "Survey of Research Personnel, Facilities, and Activities in State Departments of Education," Journal of Educational Research 51:43-45, 1957.

Wolfle and others[5] and Marquis[6] considered criteria for assessing the level of psychological research. Wolfle indicated four criteria:

1. To what extent have first-hand observations which lead to testable hypotheses been made?

2. What is the stage of theory development? May be one of four types--a. non-existent; b. vague, such as the instinct or the Freudian theory; c. specific, such as the statement of identical elements as an explanation of transfer of training; d. quantitative rational theory, such as visual theories and Hull's theoretical formulation of learning phenomena. (More recently the work of W. K. Estes, Bush and Mosteller, R. C. Atkinson, in psychology and William Coleman in sociology; Newell and Simon in computer science provide such examples.)

3. Are the problems that have been formulated, as well as the theories, stated in scientific terms? One must define precisely the variables and the criteria used in comparing them. A problem must represent a replicable situation, and variables must be defined.

4. Do the formulated concepts, theories, and problems cover the area? The theoretical or conceptual organization of an area helps to answer this question. For example, identification of unknown elements in the series of chemical elements is indicated by Mendelyew's construction of the periodic table. In psychology, conceptual schema for considering visual discrimination data have identified new types of discrimination problems for investigation.

There are no firmly fixed stages at which the formulation and testing of working hypotheses takes place in reflective thinking and research, although development of a hypothesis or theory is characterized by certain identifiable stages. Dewey[7] uses the term shuttle-like in characterizing the steps in problem solving.

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[5] Wolfle, D. et at "Standards for Appraising Psychological Research," American Psychologist 4:320-328, 1949.

[6] Marquis, D. G. "Research Planning at the Frontiers of Science," American Psychologist 3:430-438, 1948.

[7] Dewey, J. How We Think, Heath, 1933. pp. 106-118.

Following selection of the problem topic these steps include: 1. suggestions, in which the mind turns toward a possible solution; 2. intellectualization of the difficulty into a quite specific problem to be solved, a question to be answered; 3. use of one suggestion after another as a leading idea or working hypotheses to guide observation and collection of data; 4. mental elaboration of the idea or hypothesis through the process of reasoning; 5. testing the hypothesis by appropriate action.

More than almost 3/4 century ago a noted geologist, T. C. Chamberlin [8] recognized the need for multiple hypotheses. Although a single working hypothesis serves an important purpose, as a means for testing of facts and their relations, it is often at the risk of becoming the controlling idea of the study. The fact that a single hypothesis may lead research effectively along a given line may produce neglect of other equally promising lines of inquiry; for example, the hypothesis of natural selection in the 19th century. The less mature student more readily accepts a single interpretation or theory than several concurrent factors in their proper relationships. Hence, as a safequard against narrowness, the method of multiple working hypotheses was urged, with an attempt to identify every rational explanation of phenomena under consideration. The interaction of several hypotheses may amplify the recognized scope of each, sharpen the discriminating edge of each, and may contribute to methods of performance.

Publications by Hunt[9], Conrad[10], and various issues of the Phi Delta Kappan since 1956 are pertinent. At the Congressional Hearing on Mental Illness, October 2, 1953, Fillmore Sanford [11] made a prepared statement on research in mental health that summarized the APA position at that time. In England Blackwell [12] periodically summarized the educational research work current in the United Kingdom. During August and September, 1958, Dr. Randall Whaley, Executive Director, Advisory Board on Education National Research Council-National Academy of Sciences visited England and Russia to study and report on educational research activities. Under a grant from the Dominion Overseas Branch of the Carnegie Corporation of New York, S. C. T. Clarke and R. S. McArthur [13,14] interviewed research personnel in various Eastern United States organizations. Clarke reported on on-going research described to the author by persons in selected institutions and at organizations along the eastern seaboard of the U. S., Spring, 1957. Clarke [15] summarized trends and problems in educational research by categorizing topics. By far the most comprehensive survey of categories of research and topics is that done by Brehaut [16].

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[8] T. C. Chamberlin "The method of multiple working hypotheses." Scientific Monthly 59:357-62, November 1944. T. C. Chamberlin published two papers under the title of "The Method of multiple working hypotheses." One of these papers, first published in the Journal of Geology in 1897 was quoted recently by Platt ["Strong Inference" Science, Oct. 1964]. Platt wrote "This charming paper deserves to be reprinted." Chamberlin's article had been reprinted in the Journal of Geology in 1931, and the Scientific Monthly in Nov. 1944. On consulting the 1897 version, there was found a footnote in which Chamberlin indicated: "A paper on this subject was read before the Society of Western Naturalists in 1892, and was published in a scientific periodical." Library research revealed that the "scientific periodical" was Science for 7 February 1890, and that Chamberlin had actually read the paper before the Society of Western Naturalists on 25 October 1889.

[9] Hunt, H. C. "Educational research and national education policy," Journal of Educational Research 49:641-648, May 1956.

[10] Conrad, R. "A systematic analysis of current researches in the sociology of education," American Sociological Review 17:350-355, 1952.

[11] Sanford, F. "Congressional hearing on mental illness," American Psychologist 8:752-755, 1953.

McArthur,[17] carried out a study similar to Clarke's in universities of Midwestern United States. Colodarci [18] wonders if educational researchers are really prepared to do meaningful research. Cornell and McLoone [19] after reviewing studies in school administration for the Review of Educational Research indicates:

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[12] Blackwell, A. M. Current Researches in Education and Educational Psychology, London: National Foundation for Educational Research in England and Wales, 1958.

[13] Clarke, S. C. T. "Current educational research" News Bulletin, Faculty of Education, University of Alberta (Undated).

[14] Clarke, S. C. T. "Educational research in administration and supervision" Alberta Journal of Education, vol. 3, September 1957.

[15] Clarke, S. C. T. "Trends and problems in educated research" Alberta Journal of Educational Research, vol. 3, December 1957.

[16] Brehaut, W. A Quarter Century of Educational Research in Canada, 1930-1955. Department of Educational Research, Ontario College of Education, University of Toronto, Information Series No. 10.

[17] McArthur, R. S.. "Organization for educational research in universities of Midwestern United States." Alberta Journal of Educational Research 4:131-141, September, 1958.

[18] Colodarci, A. P. Are educational researchers prepared to do meaningful research?" California Journal of Educational Research 5:3-6, 1954.

[19] Cornell, F. G. and McLoone, E. P. Review of Educational Research 25:351-363, 1955.

"During the three year period there has been very little of the theoretically oriented type of research designed to provide new perspectives or new practical methods of financing education or managing school systems."

Educational research has had many capable and dedicated workers. The non-discriminating types of surveys have currently been buried by the mediocre.

Simpson[20], professor in school administration at Harvard after reviewing research for the Review of Educational Research remarked:

> "The publications strictly classifiable as research in the fields represented in this chapter are chiefly characterized by their scarcity. The author has now served as a committee member for five numbers of the Review which have dealt with finance and business administration. The story has too often been the same, particularly with the topics here covered. This is regretable, especially since a thorough canvass of literature in the areas of government and business does not indicate a greater fertility in the fields."

In commenting upon the A. E. R. A. issue "Twenty-five years of Educational Research," Virgil Herrick said that we can write an impressive history of our (educational research) efforts. An equally impressive history of the growth and development of American education can be written for the same period. What is distressing is the few occasions in which it is possible to show that the course of the latter was determined by the findings of the former. It is hard to escape the feeling that our extensive and industrious work has not yielded anything like the return we should have reasonably expected.

One reason for the disappointing influences of research on education may lie in the quality of the research itself. No critical standards have been established by the profession. Too much attention is paid to purely local, trivial and temporary problems. The fetish of empiricism leads to elaborate and expensive attempts to demonstrate experimentally hypotheses whose truth could be depended on rational grounds with much greater degrees of certainty.

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[20] Simpson, S. D. Review of Educational Research 20:135-141, 1950.

ADDENDUM TO CHAPTER VII

Summary of the report of the seminar on "Education for research in Psychology," July 28 - August 22, 1958, American Psychologist 14:167-179, April, 1959.

> "Our discussions have led to the conclusion that the confirmatory activities described by the stereotype (a) constitute but a small part of the process of active research, and that mostly in the terminal phases. While indeed this model may be reasonably accurate in describing such terminal phases and also useful in communicating clearly the results of research to others, it does not represent well the activities of the individual scientist. The task of the research psychologist is not mainly that of designing a study, collecting data, analyzing the results, and drawing conclusions ... this is not what makes the difference between run-of-the-mill and significant work.
>
> "Actually the process... is rather informal, often illogical and sometimes messy-looking affair. It includes a great deal of floundering around in the empirical world, sometimes dignified by names like 'pilot studies' and 'exploratory research'. Somewhere and somehow in the process of floundering, the research worker... will get many ideas. On largely intuitive grounds he will reject most of his ideas and will accept others as the bases for extended work.. the ideas he accepts and cherishes and in which he invests his time and resources will sometimes even fly in the face of 'known facts'.
>
> "If an idea he chooses to accept happens to be a poor one, the researcher will perhaps waste a lot of time. But there is no way of knowing this beforehand. If the idea happens to be a good one, he may make a significant positive contribution to his science--'may' because between the idea

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(a) "Crucial experiments growing out of previous findings, elaborated by self-conscious and prescient genius, are performed with great precision. The results are subjected to the closest scrutiny, with all alternative interpretations judiciously considered and accepted or rejected in accordance with the most explicit canons of scientific rigor. Finally, the now-confirmed discovery is inserted in a systematized lattice of already available knowledge to complete for posterity a forward step, however small, toward man's mastery of the unknown. Commonly these developments are seen as accomplished only with the aid of extensive intellectual paraphernalia of confirmation that include logic, theory, broad and scholarly knowledge, technical proficiency in mathematics and statistics, and a self-conscious awareness of one's place and role in the large scheme of things, as given by the history and philosophy of science."

> and the contribution lies a lot of persistence, originality, intuition, and hard work. It is in this sort of activity... that the productive researcher spends much of his time and effort. Moreover, these activities must come first in time, else there is little new or worthwhile to process with the paraphernalia of confirmation. And, of course, the job is rarely, if ever, finished by doing one experiment and finding a significant difference. Making a contribution to knowledge is a process of continuous work during which ideas change and develop."

The report indicates that the diversity of ways used by successful research people was impressive. In view of this it asks, how did the formal picture of research work ever arise? Two factors are suggested:

1) "the formal picture developed on the basis of what the finished product looks like and not on the basis of how it is achieved."
2) "if one attempts to describe something complex, one is frequently seduced into describing those aspects of it which are easily visible and easily verbalized. It is easy to measure and talk about design, statistics, scholarship, and the like. It is difficult to talk meaningfully about origination, choice, and development of ideas."

In discussing the implications of what has been said, the report adds that:

> "Education for research must do more than develop competence in designing, executing, and interpreting experimental and other studies. Development of such competence is important, but much more important is the development of the individual's creativeness--his ability to discover new relations, to reformulate or systematize known facts, to devise new techniques and approaches to problems."

Some of the significant points relative to formal aspects of graduate training are quoted below:

> "... we doubt that the more complete the individual's mastery of statistical and other tools the more effective he will be in research; we doubt that the greater his scholarly knowledge of the literature, the more likely he will be to contribute to that knowledge; we doubt that the value of theory in research increases continuously as it becomes more formalized and detailed, or (for the student) as the theories of others are more intimately and closely studied.
>
> "However, the reader should not misunderstand us: statistical competence, scholarship, and theoretical sophistication are all important in research. The point is that each of these should be means toward the end of contribution to knowledge, not ends

in themselves. The danger is that the individual may become so enamoured of statistical techniques that they largely determine his research decisions, so identified with particular theories that he cannot see problems beyond them. The danger also is that so much time will be devoted to the mastery of these means that too little time will be left for the other experiences crucial to the development of the creative researcher.

"...Competence in other supporting tool subjects (and/or skills), such as mathematics, foreign languages, biochemistry, physiology, electronics, etc., should be required freely of individuals where and as needed, but required in depth rather than as across the board hurdles that all must surmount. If a given tool subject will be valuable to the individual--if it will contribute significantly to the development of his special research potential--he should know it well."

Breadth of Scholarship:

On the relation between number and variety of graduate courses taken by candidates for the doctorate and later effectiveness in research:

"That the correlation differs significantly from zero seems doubtful. It may even be negative."...

"The kind of scholarship is probably more important than the amount. More attention needs to be given to the development of methods of teaching subject matter and of methods of individual study, such that the student acquires knowledge in ways which make it most available for use and such that he can readily acquire whatever additional knowledge he may need."

"... Departments whose coverage is relatively narrow may achieve high quality of training, and it seems wise for a department with limited resources to aim at excellence in one or two areas of specialization instead of trying to cover a wide range."

Role of Theory:

"The process of getting and developing ideas is undoubtedly a confused mixture of observation, thinking, asking why, cherishing little unformed notions, etc. Some people can and do work very effectively with ideas that have an iceberg quality, that is, most of the content is submerged in their own thinking and not made explicit until a very late stage of the research. Other people are fond of making their ideas more explicit earlier.

Development of the Individual

Selection:

> "High intelligence is prerequisite for good research work, and there is no substitute for it. High intelligence alone, however, will not produce a good research man; beyond some high minimum level other characteristics become important... perseveration on a problem with avoidance of premature closure, ability to work intensively for long periods of time, and creativity in devising good research questions."
>
> ..."Most professional training programs rightly emphasize taking of courses and mastery of content much more than... appears desirable for research. The kinds of performance required at the graduate and at the undergraduate level are... more similar... the undergraduate record is probably more valid for predicting performance in research training.
>
> "A high grade record may be evidence of high intelligence, but it may also be evidence of a tendency to social conformity which may be undesirable for research. Indeed, many types of deviant behavior may be assets in a research man... rejection of authority, perseveration on 'pet' ideas, unwillingness to commit energy in subject areas of low interest, and general independence of thinking... these same characteristics... may result in... a spotty grade record. ... evidence must be sought of those characteristics such as independence of thought and creativity without which high intelligence is of little use in research."
>
> ..."Undergraduate performance in research may be potentially one of the best predictors for use in the selection of graduate students. Unfortunately very few students have research experience as undergraduates."

Motivation:

> "We are interested in developing young psychologists who not only know how to conduct research but continue to do so. An individual is most likely to remain productive if he has found research satisfying, not only in day-to-day work, but also in certain eventual consequences."

After a discussion of varying sorts of motivation, the seminar report adds that;

> "What is important is that graduate programs be of such nature that, whatever the motivational pattern with which the student comes, his subsequent experience will develop those interests which will sustain a productive research career."

Apprenticeship:

This was regarded as "Probably the most important part of education for research..."

> "Apprenticeship here is broadly defined to include, not only a close working relation with a specific faculty member who himself is actively engaged in research, but also exposure to a more general atmosphere of productive and creative work."
>
> ..."Central to education for research is a faculty which itself is actually doing research. Given such a faculty, formal course work can very usefully supplement the development of individuals through the apprenticeship. In the absence of such a faculty and hence in the absence of meaningful apprenticeships, preoccupation with the improvement of courses offered or of various formal requirements can do little to contribute to what is crucial to research training."
>
> "... if the apprenticeship is to serve its purpose, the student must be exposed to all stages of the research process: the all-important search for ideas, the use of theory, whether vague or well-formulated, the important preliminary exploratory work as well as the design of formal experiments, the collection of data, the decisions made concerning mode of analysis, and the interpretation and communication of results."
>
> "Atmosphere is important, first of all, in the generation of ideas for research. ... New research is far likelier to appear where research is already going on."
>
> "Exposure to a research atmosphere is important for another reason. We are striving to develop, not gifted amateurs or occasional and sometime experimenters, but researchers who are 'professional' in the best sense of the word: men who have not only the intellectual and technical competence expected of the scientist, as well as the strong and persistent motivation, but also the unusual and often deviant system of values of the independent thinker. These values, we believe, are a significant part of the scientist's make-up. Important to their acquisition is an occulturation process which can occur only by exposure to the subculture of research. Values change, new proprieties are accepted, as the student lives in the atmosphere of a continuing search for knowledge. Banal as the phrase may be, there is such a thing as devotion to science, and it is contagious."

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APPENDIX A

LIST OF SCHOOLS OFFERING ADVANCED GRADUATE WORK IN EDUCATION. (Prepared with the assistance of the Directory of *Higher Education*, USOE, and the Phi Delta Kappa, *Directory of Chapters*)

APPENDIX A

List of Schools offering Advanced Graduate Work in Education
(Prepared with the assistance of the *Directory of Higher Education*,
USOE, and Phi Delta Kappa)

Alabama Polytech
U. of Alabama
American U.
Arizona State
U. of Arkansas
Baylor
Boston U.
Bradley
U. of Buffalo
Cal. (Berkeley)
Cal. (Los Angeles)
U. of S. California
Catholic U.
U. of Chicago
U. of Cincinnati
Claremont
U. of Colorado
Colorado State
Columbia
U. of Connecticut
Cornell
Denver
Dropsie
Duke
U. of Florida
Florida State
Fordham
Geo. Peabody
Geo. Washington
U. of Georgia
Harvard
U. of Houston
U. of Illinois
Indiana
Iowa State
U. of Iowa
John Hopkins
U. of Kansas
U. of Kentucky
Louisiana State
Loyola
U. of Maryland
U. of Michigan
Michigan State
U. of Minn.
U. of Missouri
U. of Nebraska
New York U.
U. of N. C.
N. C. State
U. of N. Dakota
N. Texas State
Northwestern
U. of Notre Dame
Ohio State
Oklahoma A & M
U. of Okla.
U. of Oregon
Oregon State
U. of Penn.
Penn State
U. of Pittsburgh
Purdue
Rochester
Rutgers
St. Johns
S. Baptist
S. W. Baptist
St. Louis
U. of S. Carolina
Stanford
Syracuse
Temple
U. of Tennessee
U. of Texas
Tulane
U. of Utah
Utah State
U. of Virginia
Vanderbilt
State Col. of Wash.
U. of Wash.
Washington, St. Louis
Wayne
Western Reserve
U. of Wisconsin
U. of Wyoming
Yale
Yeshiva

APPENDIX B

ITEMS TO BE COVERED BY QUESTIONNAIRES AND INTERVIEWS

APPENDIX B

Items to be covered by the questionnaires and the interview schedule used in Phase I. These items were prepared, tried out, and revised before being used.

1. Varieties of activities described as educational research? This is intended to be tried as an open end item. Responses include items like the following:

   a. Services and accounting - pupil record-keeping, preparation of budgets, preparation of salary schedules, . . .
   b. Supervisory activities - conduct of curriculum planning, guidance services, conduct of testing programs, supervisory actions, programs of teacher orientation.
   c. Conduct of public relations.
   d. Demonstrations.
   e. Action research.
   f. School surveys - community survey for new school building. . testing survey, financial survey.
   g. Correlational studies - prediction studies.
   h. Searching for evidence in favor of current practice.
   i. Experimental studies.

   (The goal in phase I was to report accurately without evaluating or making value judgments.)

2. Who does research and what are his qualifications?

   Training.
   Background.
   Experience.

3. Research processes and procedures used?

   a. Frame of reference, conceptual background, theory development, basic theory, organized knowledge. Rationale. Intellectual analysis of problem area or series of routine tasks?
   b. Hypotheses or definition of problem?
   c. Relation of tools, techniques, design, data to problem?
   d. Statistical analysis efficiently abstracts the information contained in the data.
   e. Interprets results with clarity and relevance to basic theory or knowledge. Specified within what frame of reference, and to what extent, the results of inquiry are held to be generalizable?
   f. Conception of the problem for inquiry is logically derived from (or merely loosely connected with) the general problematic situation.

- g. Where alternative choices appear in the analysis of the problem, researcher revealed awareness of the existence of the choice and shows grounds for his selection?

4. Bases for problem selection?

   Role of a prior model?
   When is a problem "too trivial," "too big?"

5. Facilities available for research?

   - a. Usable space and materials with which to work.
   - b. Freedom of time of faculty to do research.
   - c. Post doctoral fellows.
   - d. Computing facilities, library, tools, techniques, space.
   - e. Provision for visits to professional meetings, visits to other labs and facilities-travel funds.
   - f. Clerical and statistical assistance.
   - g. Consulting services.
   - h. Technical services for shop work, instrumentation, analyses, consultative service for experimental design.
   - i. Encouragement to publish - payment of costs by whom?

6. Climate or incentives for encouragement of educational research.

   - a. Upgrading-promotion and recognition includes research, administrative endorsement. How often faculty meets to discuss research done by faculty?
   - b. Attitude of faculty as a whole related to research. Environment and climate relative to research. Activity of faculty relative to research.
   - c. Courses emphasis research - critical reading and appraisal of research.
   - d. Contact with research literature and research process-merely cursory or mere analytic?
   - e. Departmental recognition of research for employment and promotion.
   - f. Administrative support of research-Items relative for development of an intellectual climate that fosters research and scholarship; provides for few diversions of energies and intellectual abilities from basic pursuit of knowledge and communication; prompt and adequate reward for achievement; provides intellectual support by colleagues; stimulation by associates and students; equate research time and rewards with extra work and consulting; no discrimination against research workers in salary, fringe benefits, and tenure.

g. Extent of released time for research by full time teaching personnel vs. hiring temporary persons for short term research projects.
h. Faculty seeks to do research and prepare selves for it; seeks freedom to do research and gives research work priority over other activities?
i. Climate characterized by: (1) active interest in research ideas, (2) faculty seminars and discussion of their research (criticisms and clarification), (3) publication in professional journals, (4) criticism or evaluation of work done, (5) teaching permeated by the spirit of research, (6) emphasis on competence and demonstrated contribution of educational research, respect for the professional worker?

7. Encouragement of cross-cultural and/or inter-disciplinary exchange of ideas, tools, techniques, devices, and data.

    a. Students in other disciplines encouraged to become interested in educational research?
    b. Faculty members encouraged to communicate with other disciplines, use facilities and equipment in other departments?

8. Promising tools, means, or avenues for improving current educational research.

    a. New and promising techniques.
    b. New and promising theories.
    c. How possibility of finding dependable results (generalizations, organization of knowledge, ...) depends on methods of sampling, experimental design, tests of significance.

9. What are the achievements of educational research at your school?

    a. Publications, papers.
    b. Changes in school practices, content, emphases, materials, ...
    c. Increase the competence of teachers and administrators.
    d. Keep faculty and students intellectually alert and at the frontiers of knowledge.
    e. Improve understanding of educational matters by developing a systematic body of knowledge. (Examples)

10. What do research workers think about the present status of their work? What are the special advantages of doing research at your school?

11. Research organization?

    a. Kind of research organization in the institution.
    b. Structure.
    c. Services rendered-gives leadership in establishing a program for training research workers, aids faculty and student research by clerical, statistical and consultative services; provides work experience for capable students? Other? Does not seek to direct or control the research. Clearly separates "administrative" from "research" control.

12. Training of research workers for schools, communities, colleges.

    a. Selection of students. (1) Who is encouraged? Attracting and recruiting of capable students? When do you recruit? (2) Bases for choosing students? (Honors, tests, academic record, ETS consistency of logic in syllogism sense) (3) Involvement of graduate students in research by faculty members. Encourage individual to investigate instead of accept.
    b. Graduate program--adequate to develop competent research workers. Should seek to develop "research-mindedness."

13. Where do you think educational research can be in the next decade? What are the contributions to research you would like to see in the next decade?

14. What do you include under educational research? Psychology, social science, ...?

APPENDIX C

FACULTY QUESTIONNAIRE FORMS

APPENDIX C

FACULTY QUESTIONNAIRE

Purpose:

A faculty member's work may be described in terms of teaching, research, public service, and administration. The attached questionnaire is designed to explore:

(1) The place of research in the faculty member's work.
(2) The support available for faculty research.
(3) Factors contributing to graduate student preparation for research.

Directions:

Please fill out this questionnaire at your earliest convenience and return it in the envelope provided. Do not write your name on the form.

Your comments on any part of the questionnaire will be appreciated.

RELATION OF RESEARCH TO YOUR WORK

1. Please indicate your present position(s) or title(s): ____________________

   ____

   What is your teaching area? ____________________

   What advanced degrees do you hold? ____________________

2. What is the approximate distribution of your time among the following activities?

   Teaching, counseling, advising, and related student-contact activities ______%

   Administrative and field service activities ______%

   Research and scholarly inquiry ______%

   Other (Please specify: ______________________________) ______%

   100%

3. How would you prefer that your time be distributed among these activities?

   Teaching, counseling, advising, and related student-contact activities ______%

   Administrative and field service activities ______%

   Research and scholarly inquiry ______%

   Other (Please specify: ______________________________) ______%

   100%

4. Are you doing any research at the present time? Yes_____ No _____

   If "yes", please give the title or a brief description of your study:

   ____

   ____

5. How do you see yourself in relation to research?

   Primarily a consumer, user, or interpreter of research __________

   Primarily a producer of research __________

   About equally a consumer and a producer __________

6. Do you feel it is important for you to do research?

Yes ______ No _______ Undecided _______

Why? ____

____

7. How important is research in your field?

_________ Essential

_________ Useful

_________ A luxury

8. Please indicate the title of a publication that you would recommend to a graduate student as an example of good research in your field.

____

Please indicate a title, or an example, of a publication in your field that is not research.

____

SUPPORT FOR RESEARCH

9. How would you describe the attitude of your School or Division of Education* toward research?

Favorable ________ Indifferent _______ Unfavorable _________

10. Faculty research activity in our Division of Education is:

Underemphasized _______

Overemphasized ________

Appropriately emphasized _______

---

*Division: School or college of education as the case might be; the branch of the institution concerned with preparation of educational practitioners and researchers

11. Most of the educational research at this institution is done by:

________ individual faculty members; ________ a bureau or institute;

________ graduate students (theses)

Please indicate the rank order of the five most common types of publications produced by the faculty of your Division of Education. Let 1 be the most common type.

________ Surveys

________ Testing programs

________ Correlational studies

________ Experimental studies

________ Discussions of school teaching practices

________ Discussions directed toward the improvement of teaching

________ Inspirational professional writing

________ Editorial type of writing

________ News notes and reports

________ Book reviews

________ Historical research

________ Philosophical research

________ Text Book and others

13. If you are doing research at the present time, how is this research supported?

________ Not supported officially; must be done on own time and resources

________ By a grant from the institution

________ By a grant from an outside agency Agency: ________________

14. How important do you consider the following factors to be to research productivity?

Associates in your Division,	Very Important	Important	Not Important
A. Who publicly endorse and speak out for research.	________	________	________
B. Who are actively working on their own research projects.	________	________	________
C. Whose research interests are similar to your own.	________	________	________

Time	Very Important	Important	Not Important
A. Reduced teaching load.			
B. Sabbatical leave.			
C. Meetings of faculty for discussions of research.			
Encouragement			
A. Administrative recognition for research activity in terms of promotion, salary, etc.			
B. Administration actively seeking funds for research from within and outside the institution.			
Organization			
A. A formal organization for aiding faculty research in education (planning studies, obtaining funds, etc.)			
Facilities			
A. Space for research needs.			
B. Equipment for research.			
C. Library or bibliographic resources.			
D. Financial support for:			
(1) purchase of equipment.			
(2) travel to research centers and professional meetings.			
(3) publication costs.			
(4) bringing research lecturers to campus.			
(5) computing costs.			
Assistance.			
A. Consulting help in formulating problem, design analysis, etc.			
B. Clerical and statistical assistance.			

(continued)

	Very Important	Important	Not Important
C. Help in preparing proposals for outside support.			
D. Secretarial and typing assistance.			
E. Help in designing, obtaining, or using measuring and data-collecting devices.			
F. Computing facilities.			
Graduate Students			
A. Capable graduate assistants.			
B. Students actively interested in research as a future career.			

Other support needed (Please specify)

____

____

15. What direct support does your institution, or division, provide in terms of the following facilities? Check "No" if this is not provided by your institution; Check "Don't Know" if you are not sure; if "yes" (faculty is provided by your institution), please indicate the extent of local support. (Do not indicate support made available by governmental or private research grants.)

	No	Don't Know	If "yes": Approximate number
A. Who publicly endorse research and scholarly work.			
B. Who are actively working on research projects.			
C. Whose research interests are similar to your own.			

D. How many faculty members are there in your education division? ____________

Time	No	Don't Know	If "yes"
A. Teaching load is reduced to aid research.	____	____	Per cent of Reduction ____
B. Sabbatical leave is available to those interested in research and advanced study. Conditions (if sabbatical leave is not automatic) ____ ____	____	____	How often?
C. Symposia on research are held.	____	____	How often? ____
D. Meetings of faculty for discussions related to research.	____	____	How Often? ____ ____

	No	Don't Know	Yes, research as a requirement for promotion is:
A. Research is an important consideration in salary increments and promotion.	____	____	Over-emphasized ____ Appropriately Emphasized ____ Under-emphasized ____ ____

Organization	No	Don't Know	If "yes"
A. There is a formal organization to aid research in education. (Aid - preparing documents for financial support, planning studies, etc.)	____	____	Name or organization ____ ____

Facilities	No	Don't Know	If "yes": Space is:
A. Space is provided for faculty research.	____	____	Inadequate ____ Sufficient ____ Generous ____

Of the total space available in your school, what per cent is used exclusively for research? ____

(continued)

	No	Don't Know	If "yes" Equipment is:
B. Equipment is provided for faculty.			Insufficient ______ Adequate ______ Generous ______
C. Bibliographic and Library facilities.			Library facilities are: Unsatisfactory ______ Satisfactory ______ Excellent ______

D. Financial support is provided for:	No	Don't Know	If "yes": Funds are: Insufficient	Satisfactory	Generous
(1) purchase of equipment for faculty research.					
(2) travel to other research centers and professional meetings.					
(3) publication costs.					
(4) bringing research lecturers to campus.					
(5) computing costs.					

Assistance	No	Don't Know	If "yes" Assistance is: Insufficient	Satisfactory	Generous
A. Consulting help in formulating problem, design analysis, etc.					
B. Clerical and statistical assistance.					
C. Secretarial and typing assistance.					
D. Help in making application for research projects.					
E. Help in developing, selecting, or using measuring and data-collecting devices.					

Graduate Assistants

How many do you have? ____ What are their duties? ______________________

How much time do they assist you weekly? ______________________

Other support provided by your school:

____

____

16. What type of support for your research is made available by grants from outside agencies?

____

____

____

____

GRADUATE STUDENT PREPARATION FOR RESEARCH

17. Please indicate the three most important objectives of the doctoral training in your Division of education. Assign 1 to the most important objective.

____ To prepare university or college administrators.

____ To prepare public school administrators.

____ To prepare university professors.

____ To prepare teachers for teacher's colleges.

____ To prepare public school teachers.

____ To prepare professional research workers.

____ To prepare educational specialists (counseling, guidance, reading, etc.)

18. On what basis does your graduate school select people for admission to the doctoral program in education? Check as many as apply.

____ Bachelor's degree.

____ Master's degree.

____ Examination - please indicate examinations used ____________________

____ Undergraduate record - Requirement: ____________________________

____ Teaching experience - Requirement: ____________________________

____ Other admission requirements: ________________________________

19. In his future work, would the typical doctoral graduate in your area be required to conduct independent research?

Yes ______ No ______ Don't Know ______

(continued)

If "yes", indicate the approximate percentage distribution of his time in:

_____ Original research in a specialized area.

_____ Applied research on practical problems in education.

_____ Other: (____)

Do you believe that the typical doctoral graduate in your area is adequately prepared to do independent research?

Yes ________ No ________ Undecided ________

20. Is training for research an important part of the doctoral program in your Education Division?

Yes ________ No ________ Undecided ________

Within your Education Division, how much emphasis is given to research training? Check as many as apply.

a. Research training receives emphasis equal to that given preparation for teaching or administration. ________

b. Research training is only a peripheral activity; it is not a major goal of graduate education work. ________

c. All doctoral students are prepared to be intelligent consumers and interpreters of research. ________

d. All doctoral students are prepared to be independent producers of research. ________

21. What emphasis do you think should be given to research training in a School of Education? Check in the appropriate column.

	Yes	No	?
a. Research training should receive emphasis equal to that given preparation for teaching or administration.	___	___	___
b. Research training should be only a peripheral activity.	___	___	___
c. All doctoral students in education should be prepared to be intelligent consumers and interpreters of research.	___	___	___
d. All doctoral students should be prepared to be independent producers of research.	___	___	___

22. Which of the following are objectives in the research training of the typical doctoral students in your department?

	Yes	No	?
a. To read and understand the general and some of the technical professional literature.	___	___	___
b. To read and understand almost all of the technical professional literature.	___	___	___
c. To write research reports.	___	___	___
d. To collect, tabulate, and analyze data on assigned problems.	___	___	___
e. To devise appropriate data collection procedures and instruments.	___	___	___
f. To define researchable problems within a problem area.	___	___	___
g. To select and use appropriate statistical procedures.	___	___	___
h. To develop or derive new statistical procedures.	___	___	___
i. To devise research plans or strategy.	___	___	___
j. To design, execute, and interpret studies that are needed for practical solutions to immediate problems.	___	___	___
k. To design and carry out original studies that represent fundamental contributions to knowledge.	___	___	___
l. To direct the research of other people.	___	___	___

23. What personal characteristics are significant in the selection of people for concentrated research training? Rank the five that you consider most important.

_____ High intelligence

_____ High scholastic record

_____ Originality, creativity, and imagination

_____ Curiosity and enjoyment of intellectual exploration

_____ Persistence in carrying projects to completion

_____ Independence of thought and investigation

_____ Knowledge of field in which he would do research

_____ Mastery of research tools and techniques

_____ Motivation to do research

_____ Mastery of statistics

Other: ____

____

24. How important do you think the following are in the training of graduate students for educational research work?

	Very Important	Important	Useful	Sometimes Useful	Trivial
a. An institutional climate which favors research	____	____	____	____	____
b. A faculty which itself is actively doing research	____	____	____	____	____
c. Formal course work in research methodology	____	____	____	____	____
d. Formal course work outside of education--logic, philosophy, mathematics, physical sciences, experimental psychology	____	____	____	____	____
e. Advanced study in an academic subject matter area	____	____	____	____	____
f. Seminars in research	____	____	____	____	____
g. Internship experience in research	____	____	____	____	____
h. Independent study	____	____	____	____	____
i. Other (____________)	____	____	____	____	____

25. Consider the doctoral graduates in your area who have taken positions during the past five years. Please indicate the rank order of the frequency of positions held now. Assign 1 to the most frequent type of position.

	Administrator	Teacher, Counselor, etc.	Researcher
Public School System			
Teacher's College			
University			

26. Compare the students preparing for academic positions (research-teaching) in a university or college with those who will enter public school work.

a. Are there differences in admission requirements?

Yes ____ No _____ If "Yes", what are these differences? __________

____

b. Are there differences in the requirements to be met for the degree by these two groups?

Yes _____ No ______ If "Yes", what are these differences? __________

____

c. What doctoral degree is granted for:

1. Those entering public school work ______________________________

2. Those entering university work ________________________________

APPENDIX C

Faculty Questionnaire Forms

a. Research Characteristics Survey.
b. Opinion Survey.
c. Faculty Questionnaire.

RESEARCH CHARACTERISTICS SURVEY

Purpose:

The following items are designed to sample attitudes and opinions on various matters relative to research in an institutional setting. While some of these items may have a factual basis, the majority are matters of impression or opinion formed as a result of observation and experience in the institution.

Most individuals would not have the information necessary to make these items entirely factual. The phrasing, therefore, has been deliberately directed toward obtaining an opinion rather than a presumed fact. While facts are available from official records, opinions, impressions, and attitudes can only be obtained directly from the individuals concerned.

Directions:

As you read each statement in the booklet, please turn to the separate answer sheet and circle:

"Y" (yes)--if in your opinion, the statement is generally true or characteristic of your school of education.

"N" (no) --if in your opinion, the statement is not true or characteristic of your school of education.

"?" ( ) --if you are undecided or don't know whether the statement is true of your school of education.

MAKE ALL RESPONSES ON THE ANSWER SHEET.

RESEARCH CHARACTERISTICS SURVEY

1. Adequate funds seem to be provided in the institution's budget to cover the cost of continuing research activities by the faculty.

2. Most faculty members are officially assigned little or no time for research.

3. This school of education is well-known nationally for its research activity.

4. When new faculty members are appointed, their background and potential as researchers seem to be given primary consideration.

5. A lecture by an outstanding researcher would be attended by half or more of the faculty.

6. Professors are sometimes invited to participate in regional and national research meetings.

7. There are experienced researchers on the faculty who are assigned to give support and assistance to younger faculty members and graduate students.

8. Time is made available at faculty meetings for discussion of faculty research.

9. It is typical to hear faculty members discussing how their research is progressing.

10. Only a minority of the professors in the school of education are actually doing research.

11. Research seminars are held where graduate students' research may be described and then appraised and criticized by other students and faculty.

12. One or more professors in education are given the title of research professors and have only minimal teaching assignments.

13. Most professors in the school of education are actively involved in research projects.

14. In many graduate education courses, students are required to design and carry out research projects.

15. Ample space, equipment, and facilities are provided by the school of education for use by those engaged in research.

16. Professors are expected to publish research findings regularly.

17. There is a faculty member designated to coordinate the research activities of the various faculty members.

18. It is a common practice for professors to use sabbatical leave for advanced study or research at another university.

19. In determining faculty load, time is explicitly allocated for research as well as for teaching.

20. The school of education publishes a journal which contains reports of faculty research.

21. Funds are provided for faculty members to travel to other research centers to talk with persons working on related problems.

22. A faculty committee is set up to assist members in planning and applying for research grants.

23. Professors are encouraged to attend and to present papers at research meetings.

24. The majority of the professors in the school of education are recognized scholars in their respective fields.

25. Most of the ongoing research in the school of education is that done by graduate students for their theses rather than by faculty members.

26. Summer research fellowships are provided so that interested faculty members may engage in full time research.

27. Professors report to their classes on the nature and results of their own and and the school's research.

28. Our faculty has members who are nationally known for their research.

29. There is concern here about the loss from teaching of excellent professors who take on extensive research programs.

30. There are good opportunities for graduate students to get to know and to work closely with faculty members who are doing research.

31. This school of education has traditionally been more concerned with service activities than with research activities.

32. Graduate courses in research, that are not required, usually have large enrollments.

33. The administrators know and show an interest in the faculty research projects.

34. Some professors in the school of education are members of interdisciplinary research teams.
35. The school of education frequently sponsors lectures by outstanding research persons.
36. Assistantships, or internships, experiences in research are available to graduate students.

37. Faculty seminars are held to discuss the current research projects or the proposed research of the members.

38. Promising graduate students are encouraged to make research a career.

39. There is a central research institute or center which provides leadership in research and in the training of researchers.

40. Teaching loads are planned so as to encourage some faculty members to spend one-fourth time or more in research.

41. Efforts are made to identify and retain as post-doctoral fellows those graduate students who show promise as researchers.

42. The administration actively seeks to gain public support for the research program of the school.

43. Most doctoral graduates of the school of education are adequately prepared to do independent research work.

44. The professors in their classes emphasize the current research in their respective fields.

45. In the school of education a larger budget is set aside for field services than for research.

46. The reading of the current research journals is a requirement in most of the graduate courses.

47. Professors are free to carry on research of their own interest rather than being restricted to research for which funds are available.

48. Faculty promotions are influenced by the extent and quality of research.

49. Many of the doctoral graduates of the school of education go into research work as a career.

50. Basic courses in research methods, statistics and logic are required in the doctoral program.

51. In the school of education, recognition is given equally for teaching and research.

52. Faculty members are encouraged by the administration to seek research grants for outside agencies.

53. There is a general atmosphere of encouragement for one's research both from the administration and from colleagues.

54. Faculty members are aware of the research projects being conducted by the other members.

55. Some professors are members of an academic department as well as a professional department.

56. Most of the research in the school of education is done by those faculty members having their own contract funds.

57. Released time for research is given only when the faculty member has his own research funds from an outside source.

58. There is a formal organization to aid faculty research in the school of education.

59. Faculty members typically express an interest in doing more research.

60. Library resources, providing the current research journals, government and professional publications are available to the researcher.

61. The administration immediately communicates to all faculty members any information concerning available research grants.

62. The school of education pays the publication costs for the faculty members.

63. Each faculty member is provided a graduate or an undergraduate student assistant.

64. There is concern here about the effect on research productivity of the extension teaching or overseas teaching assignments of faculty members.

65. This school of education lacks a sufficient body number of trained research workers with a broad scientific background who have the capacity for conducting programmatic research.

66. Rendering consulting advisory services or conducting surveys constitutes the extent of "research" activities in this school of education.
Or, the activities of the researchers in the school of education are directed mainly toward rendering advisory services or conducting surveys.

67. The educational research in this school is carried on by just a few professors.

68. There is little research done in this school of education that could be described as original research or research that contributes to new knowledge.

69. A minor in only one academic area is required of all doctoral students.

70. A program of independent work and study is arranged for the able doctoral students.

OPINION SURVEY

This section consists of a series of statements about research. Please read the following statements and indicate whether you

SA - Strongly agree.

A - Agree.

U - Undecided.

D - Disagree.

SD - Strongly disagree.

1. In a school of education, quality teaching should be more important than research activity.
2. Courses in research at the advanced graduate level should be optional rather than required.
3. Many of the faculty publications are not really research.
4. Too much faculty time is taken from teaching and research for the service activities of the school.
5. No student should pursue graduate work in education until he has had at least two years of practical teaching experience.
6. I feel confident about my ability to carry on independent research.
7. Most doctoral graduates of the school of education are poorly equipped to undertake independent research projects.
8. Promotions should depend upon evidence of scholarly research and writing.
9. The emphasis in graduate training in a school of education should lie on preparation for administrative work or teaching rather than on research training.
10. Doing research is too time-consuming for busy professors to engage in.
11. An individual's interest and competence in research should be given more consideration when selecting new faculty members.
12. Faculty members in the school of education should be given more time off to do research.
13. A school of education, especially in a state-supported institution, should devote itself to its local or regional clientele and not be concerned with its national impact.
14. Research is not sufficiently emphasized in the professional climate of the school of education.

15. The doctoral program in education is oriented too much to the practical and professional and not enough to research and academic learning.

16. Most of the professors are too concerned with their research and not enough with their teaching.

17. Preparation for research should receive emphasis equal to that given preparation for teaching and service in the doctoral education program.

18. So much of the energy of faculty members goes into group and committee activities that little energy is left to do research.

19. Advanced courses in research are all right for some graduate students in the school of education, but a waste of time for most.

20. At this school there is too much pressure on faculty members to publish.

21. Teaching is intrinsically more satisfying than research.

22. The research climate in the school of education seems to be conducive to the development of research workers among graduate students.

23. A knowledge of research technique placed at the command of a shrewd intellect represents the essential ingredient of successful research.

APPENDIX D

GRADUATE STUDENT QUESTIONNAIRE FORMS

APPENDIX D

Graduate Student Questionnaire

Purpose

This questionnaire is designed to obtain information concerning the graduate training program in research in schools of education and the opinions of doctoral students toward research.

Directions

Please fill out this questionnaire at your earliest convenience and return it in the envelope provided.

Do not write your name on the form.

1. Please indicate the degree for which you are working________________

   Your major______________________ Your minor (s) __________________

   When do you expect to complete your doctorate? ____________________

2. What type of position do you hope to obtain after graduation?_______

   ____

3. Will your future work probably require competence in research?

   Yes ____ No ____ Don't Know ____

   If "yes", please estimate approximately how much of your time will be spent in research.

   More than 90% ____ 75-90% ____ 50-74% ____ 25-49% ____

   less than 25% ____

4. Would you enjoy doing research as a part of your future work?

   Yes _____ No _____ Undecided _____

5. What has been the extent of your experience with educational research? Check as many as apply.

____ Results of research are regularly discussed in graduate education courses

____ The reading of research is a requirement in graduate education courses

____ Conducting research studies is a requirement in graduate education courses

____ Formal courses in research methodology   Number of courses ____

____ Seminars in research   Number ____

____ Graduate assistantship in research

____ Thesis

____ Other (please specify: ______________________________)

6. To what extent do you believe yourself prepared to do independent research in your area?

____ Completely prepared to do independent research

____ Need some help in designing and analyzing studies

____ Need substantial help in designing and analyzing studies

____ Do not feel prepared to do independent research

7. What emphasis do you think should be given to research training in a school of education? Check in the appropriate column.

	Yes	No	?
Research training should receive emphasis equal to that given preparation for teaching or administration	___	___	___
Research training should be only a peripheral activity in a school of education; it is not one of the major objectives of graduate work in education	___	___	___
All doctoral students in education should be prepared to be intelligent consumers and interpreters of research	___	___	___

7. (cont.)

	Yes	No	?
All doctoral students should be prepared to be independent producers of research			

8. Within your school of education, how much emphasis is actually given to research training?

	Yes	No	?
Research training receives emphasis equal to that given preparation for teaching or administration			
Research training is only a peripheral activity in this school of education			
All doctoral students in education are prepared to be intelligent consumers and interpreters of research			
All doctoral students are prepared to be independent producers of research			

9. How important do you think the following are in the preparation of students for educational research work?

	Very Important	Important	Useful	Sometimes Useful	Trivial
An institutional climate which favors research					
A faculty which itself is actively doing research					
Formal course work in research methodology					
Formal course work outside of education--logic, math., philosophy, physical science, experimental psychology					
Advanced study in an academic subject matter					
Seminars in research					

9. (cont.)

	Very Important	Important	Useful	Sometimes Useful	Trivial
Internship experience in research					
Independent study					
Other: ______________					

10. How would you describe the attitude of your school of education toward research?

Favorable _____ Indifferent _____ Unfavorable _______

11. Who does the educational research at your institution? Please rank the following letting 1 be the most productive source of research.

_____ Graduate students (theses)

_____ Individual faculty members

_____ A formal organization (such as a bureau or institute)

_____ Other (please specify: ________________________________)

12. Faculty research activity in this school of education is:

Underemphasized ____ Overemphasized ____ Appropriately Emphasized __________

13. Please indicate the title of an example of good research in your field.

____

Please indicate the title of a study that represents typical research in your field.

____

Please indicate some features that might distinguish between good and typical research in your field.

____

____

____

____

14. What personal characteristics are significant for or characteristic of the successful educational researcher? Rank the five that you consider most important.

_____ High intelligence

_____ High scholastic record

_____ Originality, creativity, and imagination

_____ Curiosity and enjoyment of intellectual exploration

_____ Motivation to do research

_____ Persistence in carrying projects to completion

_____ Independence of thought and investigation

_____ Knowledge of field in which he would do research

_____ Knowledge of statistics

_____ Mastery of research tools and techniques

_____ Other: ____

15. From the following list, check those adjectives that you would use to describe educational research.

_____ useful

_____ practical

_____ exciting

_____ original

_____ routine

_____ amateurish

_____ theoretical

_____ creative

_____ inconsequential

_____ superficial

_____ valuable

_____ scholarly

_____ worthless

_____ rigorous

_____ interesting

_____ important

_____ scientific

APPENDIX E

INTERVIEW SCHEDULES

APPENDIX E

Interview Schedules

I. Dean's or Chief Administrator's Interview.

A. General:

1. What factors do you consider important in the operation of an outstanding school of education?
2. How would you define educational research? or, How do you decide a project is or is not educational research?
3. How important do you think educational research is for the well-being of your school of education?
4. Can anyone do research? or, Are special learnings and skills required? If so, what are some of the desirable prerequisites?
5. What facilities are most important for doing educational research?

B. Training of future educational researchers:

1. Request a catalog and/or other literature that describes requirements and courses for educational research training.
2. After completing their graduate work, are students fully prepared to do independent research in their major area?
3. What requirements do you regard as significant in the preparation of research workers?

C. Encouragement and support of educational research:

1. How important is educational research in comparison with the functions of instruction and service?
   (Ask what per cent of the total budget of the school is allocated to each function--teaching, service, and research. The total should equal 100.)
2. What incentives are provided for encouraging educational research? (Promotions; time off from teaching; funds for special needs; space, equipment; apparatus and instrumentation; computing facilities; library; travel to professional meetings; seminars, symposia, colloquia in research; faculty committees to study and encourage research; a formal organization for research; visits to other laboratories; inter-disciplinary exchange of ideas and criticisms relative to research, etc.)

D. Ask that the time distribution schedule be filled out. (see next page)

E. Ask that faculty most active in doing research be identified and indication of per cent of time available for research by relief from teaching and other responsibilities.

F. Prepare a schedule of interviews. Call and make appointments to prepare for faculty interviews.

II. Faculty Member's Questions.

A. Case history of a current or recent problem or project. (Recent means completed during the past 12 months.)

1. Background -- what did it grow out of?
2. Questions that were studied?
3. Tools, techniques, devices, design used in collecting and analyzing the data.
4. Interpretation of results.

B. Who is doing research like yours? (Audience or group of experts with whom you can communicate?)

C. Significance of research like yours?

1. Should more of this kind of research be encouraged?
2. What aspects of your research appears to be most worthy of encouragement?
3. On what bases would you decide whether a piece of educational research was exceptional?

D. Encouragement and support of research at your school?

1. How important is research in comparison with teaching and service responsibility? (e.g., How should the per cent of time be distributed among these three responsibilities?)
2. What incentives are provided for encouraging educational research? (Promotions; time off from teaching; funds for special needs; space, equipment; instruments, computing facilities, library; travel to professional meetings, visiting lecturers, symposia or colloquia for discussing results of research, . . .?)

E. Training for research?

1. When is a person capable of doing research in your area?

College of Education
Amount of Time Released for Research
First Semester, 1958-59

Staff Ranks	0%	10%	15%	16%	17%	20%	33%	40%	50%	67%	75%	100%
Professors												
Associate Professors												
Assistant Professors												
Instructors												
Associates												
Lecturers												
Assistants												
No Rank												
TOTALS												
On Leave												

To be filled out by Dean's Office

A. STAFF WITH RELEASED TIME FOR RESEARCH

Individuals	% of Individuals with Time Released	Full Time Equivalent Released Time	Mean % of Time Released

B. ALL STAFF

Individuals	Mean % of Time Released

To be filled out by Dean's Office

2. How does training that is regarded as acceptable for educational research compare with that given for research in psychology, sociology, . . .? (Course work, apprenticeship experience, selection of candidates, etc.)

F. Criteria for acceptable research in your field?

G. What per cent of your time is devoted to research, teaching and service. (The total should equal 100.)

APPENDIX F

LIST OF DOCTORAL THESES SELECTED FOR TABULATION

APPENDIX F

List of Doctoral Theses* Selected for Tabulation

Arizona State

Curtis, Juanita. The Relative Effectiveness of Two Different Methods on Teaching Spelling.

California, Berkeley

Musdeking, George H. The Role of the Lutheran Church in Family Life Education.

Myers, James E. The Educational Work of Andrew Jackson Moulder in the Development of Public Education in California, 1850-1895.

Weichert, William S. The Problem-Solving Behaviors of Two Groups of Seventh-Grade Pupils.

California, Los Angeles

LaBounty, Hugh O., Jr. Edwin Augustus Lee; Portrait of an Educator.

Chicago

Allen, Lawrence A. The Growth of Professionalism in the Adult Educational Movement since 1928-1958. A Content Analysis of the Periodical Literature.

Ammons, Margaret P. Educational Objectives: The Relation between the Process Used in Their Development and Their Quality.

Axford, Roger W. William H. Lighty--Adult Education Pioneer.

Blanke, Virgil E. Educational Policy Formulation at the State Level as Viewed by Chief School Officers.

Bruen, Hanan. The Impact of Social and Political Factors upon the Teaching of History in the Secondary Schools of Imperial Germany and the Weimer Republic.

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*Titles
Abstracted from
theses listed in Young, A. N. Research Studies in Education, 1953 to 1957, Phi Delta Kappa, Bloomington, Indiana.

Carbone, Robert Frank, Achievement, Mental Health, and Instruction in Graded and Nongraded Elementary Schools.

Counelis, James Steve. American Government, Higher Education and the Bar.

Daigneault, George Henry. The Arts Department Chairman as a Source of Role Conflict.

El Gaber, Gaber Abd. Needs and Values of Egyptian and American Secondary School Teachers: A Cross-Cultural Study.

Faber, Charles Franklin. The Midwest Administration Center: Its First Ten Years.

Fern, William H. Aspects of Problem--Perception and Problem-Solving in Educational Administration.

Field, Elois Rachel. A Study of the Influence of Selected Variables upon Agreement or Disagreement among Observers Appraising Behaviors in Performance-Learning Situations.

Goldman, Samuel. Sub-Public Perception of the High School Graduate and the Roles of Institutions.

Gum, Moy Fook. The Adient and Abient Types of Teachers as Conceptualized by Students.

Halfter, Irma Theobald. The Comparative Academic Achievement of Women Forty Years of Age and Over and Women Eighteen to Twenty-Five Years of Age.

Hartrick, Walter, J. Perceptions of the Task and Program of the Public High School.

Hills, Richard Jean. The Relationship between the Educational Expectations of Social Class and the Role Expectations within the Public High School.

Howard, Elizabeth Zimmermann. Teacher Training and Student Change: An Analysis of Attitudes, Needs, and Performance.

Lopez, Ramon Reyes. A Study of Attitudes toward the Army among Male High School Seniors; and the Relationship between These Attitudes, Social Class, and "Dominant Interests in Personality."

Madsen, David L. History of an Idea: The University of the United States.

Maynard, Richard Ely. The Lise and Its Curriculum in the Turkish Educational System.

Mellinger, Morris. Factors Determining the College Choice of Municipal Junior College Students.

Peoples, John Arthur, Jr. Upward Communication as Affected by the Behavior of the Administration.

Peterson, Donald. Prospective Teachers' Concepts of Self, Teacher, and School.

Singh, Kirpal Tejindar. Determining Objectives for Secondary Education in India--A Methodological Study.

Stanek, Murial Novella. The Implications of Teacher Attitudes for Curricular Adaptations in Metropolitan Elementary Schools Affected by Social Change.

Claremount

Barrett, Jean. Identify Crisis in Atypical Adolescent Boys.

Colorado

Bobgan, Martin. A Comparison of Variability in Identification and Self-Acceptance of Male Delinquents and Male Socially Acceptable School Students.

Colorado State

Frease, Cynthia Rice. Mary Stolz, Junior Novelist: An Analysis of the Literary Characteristics and the Concern with Developmental Tasks of Adolescence in the Stolz Junior Novels, and the Reaction to Them of Professional Critics and Adolescent Girls.

Holley, Donald League. A Theoretical Study of the Public Speaking of George Willard Frasier.

Columbia

del Toro, Jose E. The Expressed Interests and Concerns of Puerto Rican Youth in 1948-49: What They Suggest for Secondary Education.

Jacobson, David. An Exploration of the Effect of Parental Attitudes on the Sex Identity of the Child during His Latency Period--A Case Study Approach.

Miller, Barbara B. Effects of Father Absence and Mother's Evaluation of Father on the Socialization of Adolescent Boys.

Rowley, Virginia. J. Russell and Smith, Geographer, Teacher and Conservationist.

Westbrook, May A. The Construction of an Objective Paper and Pencil Test to Assess the Empathic Ability of Adolescents.

Connecticut

Skelly, Clyde Gordon. Some Variables which Differentiate the Highly Intelligent and Highly Divergent Thinking Adolescent.

Duke

Bullock, Thomas Kirby. Schools and Schooling in 18th Century Virginia.

Florida State

Spence, Betty Lentz. The Interrelationships of the Concepts of Self and Others, Social Acceptability, and Curriculum Patterns.

George Peabody

Nagy, James E. A Collection of Materials Related to Superintendent Joshua F. Pearl.

Newport, Vivian. The Biographical Writing of John Buchan.

Strain, John P. Whitehead's Concept of Human Experience as It Clarifies Educational Precision.

West, Earle Huddleston. The Life and Educational Contributions of Barnas Sears.

Harvard

Sizer, Theodore Ryland. The Committee of Ten.

Indiana

Addington, Chester Luther. A Review of Research in Personnel Administration Useful in Education.

Annarino, Anthony A. A Comparison of the Relative Effectiveness of Two Methods of Soccer Instruction.

Bagley, Ayers L. The Concept of Continuity in Recent Educational Thought.

Bakrow, William John. The Relative Effectiveness of Certain Procedures and Practices in Fund-Raising in Selected Colleges and Universities.

Barnes, Alfred Cavis. Characteristics of Personality and Attitude Relationships of Selected Male Traffic Violators and Non-Violators.

Bennett, Ambrose Mack. Legal Aspects of Indiana School Property Laws in the Area of Acquisition, Management, Use, and Disposition.

Bhaopichitr, Mallika. A Study of Evaluation of Academic Achievement of Secondary School Students in Thailand with Recommendations for Improvements.

Boykin, William Cola, Sr. Competencies Needed by Vocational Agriculture Teachers for Effective Farm Mechanics Instruction.

Bruce, Patricia Jane. The Effects of Conscious Relaxation and a Floatation Device on Learning Beginning Swimming Skills.

Burnett, Richard W. The Diagnostic Problem-Solving Proficiency of Elementary Teachers in Teaching Reading.

Campanale, Eugene, Angelo. An Appraisal of Elementary-Junior High School Articulation in the Bloomington, Indiana Schools.

Conaway, John Oliver. A Study of Education, Vocational Training and Occupational Experience of Selected Inmates of the Indiana State Reformatory.

Cox, Charles Benjamin. A Description and Appraisal of a Reflective Method of Teaching United States History.

Crane, Robert Merlin. Manpower Problems and Higher Education in Iowa: A New Alliance.

Curl, David Harry. An Exploratory Study of a Self-Instructional Method for Teaching Equipment Operation.

Darrow, Harriett Driskell. The Relationship of Certain Factors to Performance of Elementary Student Teachers with Contrasting Success Records in Student Teaching.

Davis, Nancy Benefill. Teacher Perception of Pupils as Related to Certain Variables.

DeGraff, Richard Aloysius. A Comparison of the Structure of Oral Language at the First, Third, and Fifth Grade Levels.

Dodson, James Marvin. A Comparative Study and Analysis of Selected Procedures in Achieving Desirable School Legislation.

Elsmere, Robert Tofte. An Experimental Study Utilizing the Problem-Solving Approach in Teaching United States History.

Evaul, Thomas W., Jr. The Effect of All Male, All Female, and Coeducational Classes on Skill Development in Badminton.

Evertts, Eldona Louise. An Investigation of the Structure of Children's Oral Language Compared with Silent Reading, Oral Reading, and Listening Comprehension.

Feuerbach, Franklin Kenneth. Personnel Policies Affecting Certain Noninstructional School Employees.

Fox, James Walker. Analysis of University Image Projection to the Student Public as Influenced by Certain Student Characteristics.

Gayles, Anne Richardson. Proposed Program for the Improvement of College Instruction at Florida Agricultural and Mechanical University.

Gilbert, Monroe Allen. A Study of Measured Empathy Scores Compared with Judgments of Nonverbal Emotional Behavior for Two Groups of Counselor-Trainees.

Grantham, James Wendell. A Study of the Problems of Beginning Teachers in Selected Secondary Schools of Mississippi.

Grout, Geraldine Isabel. Relevancy of Learning Experiences in Courses of the Professional Sequence at Washington Missionary College to Problems of Seventh-Day Adventist Academy Teachers.

Hale, Sidney Webster. An Evaluation of Organizational and Administrative Practices of Little League Baseball in the State of Ohio.

Hannarkin, Panas. A Proposed Mathematics Program for the Comprehensive Secondary School in Thailand.

Hanawalt, Dwight L. An Analysis and Evaluation of the Resident Camping Program of the Church of the Brethren.

Harrow, Martin. Factors Involved in the Facilitative Effects of Learning Reversal Shifts.

Hill, Edwin S. An Analysis of the Results of Special Training in Listening Compared to Special Training in Reading Skills.

Hinton, John Eugene. A Survey and Appraisal of the Position of City School System Public Relations Director.

Hochstetler, Ruth Jean. An Analysis of the Oral Language of Fifth Grade Children in Guided Situations.

Hoerner, Sister Marie William. An Analysis of Student Expenditures in High Schools for Girls Staffed by the Sisters of Providence of St. Mary-of-the-Woods, Indiana.

Hudson, Bruce M. Leadership among Ninth-Grade Students in the Extra-class Organizations of Selected Junior and Senior High Schools in Indiana.

Huxol, Harry Rommel. Effects of the Revised Admissions Policy for Freshmen on Entering Music Majors of the Class of 1958 at Indiana University.

Johns, Thomas Howard. Public Relations with Church Constituency in Ten Presbyterian-Related Colleges.

Johnson, Ernest L. A Study of the Relationship between Certain Propositions of Client-Centered Therapy and Certain Tenents of the Philosophy of Existentialism.

Jordan, Kenneth Forbis. An Analysis and Evaluation of Legislative Policy Concerning Public School Curriculum in Indiana.

Jutten, Jessie Bernadine. A Job Analysis of Women Physical Education Teachers in Selected Senior High Schools in Missouri with Implications for Teacher Education.

Kelley, Thomas Daniel. Utilization of Filmstrips as an Aid in Teaching Beginning Reading.

Kenworthy, Leslie Frederick. A Survey of Certain Aspects of FTA Club Programs in Selected New Jersey Public High Schools.

Koehler, Margaret Louise. The Effects of Set and Number of Trials of Problem-Solving in Nursing Situations.

Lightfoote, William Edward. The Development of a Plan for Vocational Training at the Alabama Industrial School for Negro Boys and Girls.

Listor, Ruth. An Emphasis Analysis of Selected Films Dealing with Administration.

Loessner, Ernest Joseph. The Expressed Religious Education Needs of Adults of Two Contrasting Educational Levels, with the Teachers' Perceptions of Their Expressions of Needs.

Long, David Eugene. A Study of Socio-Economic Status as Related to Various Characteristics of Selected Students at Indiana University, Fall 1960.

McIlroy, Jane Susan. An Evaluation of the Physical Education Programs for Women in Selected Institutions of Higher Learning in Three Northwest States.

Magary, James Frederick. An Analysis of the Vocational Interests of Educable Mentally Retarded Adolescent Boys from Three Occupational Classes.

Mascho, George LeRoy. An Investigation of a Selected Number of Beginning First Grade Children's Familiarity with Measurement.

Massialas, Byron G. Description and Analysis of a Method of Teaching a High School Course in World History.

Matson, Robert Edward. A Study of Academic Potential and Achievement in Prestige-Rated Fraternity Groups as Compared with Dormitory Residents and Off-Campus Students.

Mayer, Frank Carl. A History of the Indiana Association of Junior and Senior High School Principals.

Mercer, Walter Alexander. The Organization and Administration of Off-Campus Student Teaching in Relation to Professional Laboratory Experiences in Selected Institutions of Georgia.

Myers, Noel Thomas. Characteristics of Most and Least Effective International Cooperation Administration Educators Serving Overseas.

Myers, Thelma Janet. Survey of Opinions of Indiana Elementary School Principals Regarding Special Classes for Educable Mentally Retarded.

Osborn, Robert Lee. Patterns of Separation of Church and State in Relation to Education.

Paeratakul, Chawal. An Investigation of the Efficiency of the Indiana University Freshman Orientation Test Battery and Its Implications for Counseling and Guidance.

Parker, Aileen Webber. A Comparative Study of Selected Factors in the Vocational Development of College Women.

Ralston, Nancy Caroline. A Study of the Advanced Placement Program in the Cincinnati Public Schools.

Sams, Denver. Implications of Automation for Industrial Education.

Sangalang, Luz E. Some Aspects of Science Education for Rural Philippines and Implications for the Education of Teachers for the Community Schools.

Santry, Helen Secrest. An Evaluation of Parental Responses to Selected Types of Public Relations Techniques Used by Kindergarten Teachers.

Sayed, Fathelbab Abdelhalim. Experimental Comparison of the Effectiveness of Positive vs. Negative Instances upon Concept Attainment Using Instances from Instructional Films.

Stahly, Harold LeRoy. A Theoretical and Empirical Study of Decisional Behavior of Teachers.

Sukontarangsi, Swat. The Development of Governmental Control of Public Education in Thailand.

Swank, Theron Edwin. An Analysis of the Social Diffusion of an Audio-Visual Message through a Church Congregation.

Thompson, Bertha Boya. The Relation of Auditory Discrimination and Intelligence Test Scores to Success in Primary Reading.

Thumm, Helen M. The Organization and Academic Functions of the Faculty in Educational Units in Nursing in Selected Institutions of Higher Learning.

Tyo, John Henry. A Comparative Analysis of Motion Picture Production Courses Offered in Selected Colleges and Universities in the United States.

Vangalla, Rukma Rao. Construction and Validation of an Instrument to Measure Teacher Understanding of Elementary School Pupil Behavior.

Wiley, Alfred Drefla. A Study of Desegration in the Evansville School Corporation, Evansville, Indiana.

Williams, Fred Earl. An Experimental Comparison of Equivalent Verbal and Verbal-Pictorial Tests in a University Audio-Visual Course.

Williams, Reese Morton. Analysis of Factors Related to Need as Determining Financial Ability of Scholarship Applicants to Attend Indiana University.

Wilson, George Thomas. An Analysis of Effective Practices Employed to Reduce Vandalism in Park, Recreation, and Combined Departments in American Cities of over 50 Thousand Population.

Illinois

Adamak, Edward George, Jr. The Effects of Testing and Two Methods of Test Interpretation on Selected Self-Perceptions.

Brim, Charles William. Inter-High School Variability and Its Effect on the Prediction of College Achievement.

Carlson, William Arthur. The Relationship between Success in Group Counseling and Discrepancies in Levels of Personality.

Carse, William Thomas. Relations among Teachers' Self-Perceptions, Educational Viewpoints, and Use of Test Results.

Colwell, Richard James. An Investigation of Achievement in Music in the Public Schools of Sioux Falls, South Dakota.

Denny, Terry Patrick J. The Academic Achievement of Roman Catholic Students in Public High Schools.

Dodds, James Harvey, Jr. A Study of the Methods Used by School Boards in Studying Local Patterns of Administrative Organization and Staffing.

Duxla, Walter Boleslav. The Prediction of Three Major Dimensions of Teacher Behavior for Student Teachers in Music Education.

Espenschied, Roland Frederick. Major Findings of a Study of Parental Attitudes toward Vocational Agriculture.

Frey, Roger Marshall. Reading Behavior of Public School Brain Injured and Non-Brain Injured Children of Average and Retarded Mental Development.

Gliessman, David Henry. Abstractness and Informal Organization of Reading Material: Their Effect on Reading Performance and Relationship to Selected Intellectual Characteristics.

Grupe, Audrey Jean. Adjustment and Acceptance of Mentally Superior Children in Regular and Special Fifth Grade Classes in a Public School System.

Holloway, William Jimmerson. Special Educational Services Provided by Intermediate School Districts in Standard Metropolitan Areas.

Hunka, Stephen Mirosko. A Study of Transfer Using Generalized Learning Curves.

Jordan, Laura Josephine. The Efficacy of a Reading Readiness Program with the Educable Mentally Retarded.

Kaltsounis, Theodore. A Study Concerning Third Graders' Knowledge of Social Studies Content Prior to Instruction.

Keenan, Dorothy Maie. An Exploration of Value Patterns.

King, Willis Lorenzo. The Philosophical Foundations of the Educational Theory of Johann Gottlieb Fichte.

Knowlton, Ronald Gordon. A Ballistocardiographic Investigation of Cardiac Responses to Physical Training with a Select Group of Adult Males.

Lemmon, Louise. A Comparison of Consumer Economic Knowledge of Two Populations of Illinois High School Home Economic Teachers and Their Students.

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Pennsylvania State

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Pittsburgh

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Purdue

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APPENDIX G

SUMMARY OF FACULTY QUESTIONNAIRE

BIVARIATE DISTRIBUTIONS

APPENDIX G

Summary of Faculty Questionnaire Responses

Bivariate Distributions

1. Faculty Questionnaire Code Sheets.
2. List of Bivariate Distributions Exhibiting Differences Between Administrators and Professors That Were Statistically Significant.

FACULTY QUESTIONNAIRE CODE SHEETS

Column	Description
A. 1st Card:	
1-3	ID #
4	Card #
5-6	
7-8	Position or Title (Item 1)
	01 Professor
	02 Associate Professor
	03 Assistant Professor
	04 Instructor
	05 Lecturer
	06 Coordinator
	07 Teaching Associate
	08 Research Associate
	09 Sup
	10 Head or Chairman of Department
	11 Director
	12 Dean

Distribution of Time (Item 2)
9-11 % Teaching, Counseling, Advising, etc.
12-14 % Administrative and Field Service
15-17 % Research and Scholarly Inquiry
18-20 %Other

Preferred Distribution of Time (Item 3)
21-23 % Teaching, Counseling, Advising, etc.
24-26 % Administrative and Field Service
27-29 % Research and Scholarly Inquiry
30-32 % Other

33 Doing research at the present time? (Item 4)
0 No
1 Yes

Relation to Research (Item 5)
34 Primarily a consumer of research
0 No
1 Yes

35 Primarily a producer of research
0 No
1 Yes

36 About equally a consumer and a producer
0 No
1 Yes

37 Is it important for you to do research (Item 6)
0 No
1 Yes

38 How important is research in your field? (Item 7)
0 A luxury
1 Useful
2 Essential

39 Attitude of School toward research (Item 9)
0 Unfavorable
1 Indifferent
2 Favorable

40 Faculty Research Activity (Item 10)
0 Underemphasized
1 Appropriately emphasized
2 Overemphasized

Column	Description
41	Most of research done by (Item 11): Individual Faculty Members 0 No 1 Yes
42	A Bureau or Institute 0 No 1 Yes
43	Graduate Students 0 No 1 Yes
	Rank Order of the Five Most Common Types of Publications Produced by the Faculty of School (Item 12):
44	Surveys
45	Testing Programs
46	Correlational Studies
47	Experimental Studies
48	Discussions of School Teaching Practices
49	Discussions Directed toward the Improvement of Teaching.
50	Inspirational Professional Writing
51	Editorial Type of Writing
52	News Notes and Reports
53	Book Reviews
54	Historical Research
55	Philosophical Research
56	Textbooks
57	How research is supported? (Item 13) Not supported officially; must be done on own time and resourses. 0 Blank 1 Marked (x)
58	By a grant from the institution 0 Blank 1 Marked (x)
59	By a grant from an outside agency 0 Blank 1 Marked (x)
	How important do you consider the following factors to be to research productivity? (Item 14) Associates
60	Who publicly endorse and speak out for research 0 Not Important 1 Important 2 Very Important
61	Who are actively working on their own research projects 0 Not Important 1 Important 2 Very Important

Column	Description
62	Whose research interests are similar to your own 0 Not Important 1 Important 2 Very Important
	Time
63	Reduced teaching load 0 Not Important 1 Important 2 Very Important
64	Sabbatical leave 0 Not Important 1 Important 2 Very Important
65	Meetings of faculty for discussions of research 0 Not Important 1 Important 2 Very Important
	Encouragement
66	Administrative recognition in terms of promotion, salary, etc. 0 Not Important 1 Important 2 Very Important
67	Administration actively seeking funds for research 0 Not Important 1 Important 2 Very Important
	Organization
68	A formal organization for aiding faculty research 0 Not Important 1 Important 2 Very Important
	Facilities
69	Space for research made 0 Not Important 1 Important 2 Very Important
70	Equipment for research 0 Not Important 1 Important 2 Very Important
71	Library or bibliographic resources 0 Not Important 1 Important 2 Very Important
72	Financial support for purchase of equipment 0 Not Important 1 Important 2 Very Important

Column	Description
73	Financial support for travel to research centers and meetings 0 Not Important 1 Important 2 Very Important
74	Financial support for publication costs 0 Not Important 1 Important 2 Very Important
75	Financial support for bringing research lecturers to campus 0 Not Important 1 Important 2 Very Important
76	Financial support for computing costs 0 Not Important 1 Important 2 Very Important

B. 2nd Card:

1-3	ID #
4	Card #
5-6	
	How important do you consider the following factors to be to research productivity? (Item 14 Contin'd) Assistance Consulting help in formulating problem, design, analysis, etc. 0 Not Important 1 Important 2 Very Important
8	Clerical and statistical assistance 0 Not Important 1 Important 2 Very Important
9	Help in preparing proposals for outside support 0 Not Important 1 Important 2 Very Important
10	Secretarial and typing assistance 0 Not Important 1 Important 2 Very Important

Column	Description
11	Help in designing, obtaining, or using measuring and data- collecting devices 0 Not Important 1 Important 2 Very Important
12	Computing facilities 0 Not Important 1 Important 2 Very Important
	Graduate Students
13	Capable graduate assistance 0 Not Important 1 Important 2 Very Important
14	Students actively interested in research as a future career 0 Not Important 1 Important 2 Very Important
	What direct support does your institution provide in terms of the following facilities? (Item 15)
	Associates
15	Who publicly endorse research and scholarly work 0 No 1 Yes 2 Don't Know
16	Who are actively working on research projects 0 No 1 Yes 2 Don't Know
17	Whose research interests are similar to your own 0 No 1 Yes 2 Don't Know
18-20	Number of Faculty Members in Education Division
	Time
21-23	Teaching load is reduced to aid research 000 No 1xx Yes (xx indicates %) 200 Don't Know
24-26	Sabbatical leave is available to those interested in research 000 No 1xx Yes (xx indicates years/leave) 200 Don't Know

Column	Description
27-29	Symposia on research are held 000 No 1xx Yes (xx indicates weeks/symposium) 200 Don't Know
30-32	Meetings of faculty for discussions related to research 000 No 1xx Yes (xx indicates weeks/meeting) 200 Don't Know
	Encouragement
33-34	Research is an important consideration in salary increments and promotion 00 No 10 Yes, research as a requirement for promotion underemphasized 11 Yes, appropriately emphasized 12 Yes, overemphasized 20 Don't know
	Organization
35	There is a formal organization to aid research in education 0 No 1 Yes 2 Don't know
	Facilities
36-37	Space is provided for faculty research 00 No 10 Yes, space is inadequate 11 Yes, space is sufficient 12 Yes, space is generous 20 Don't know
38-39	Equipment is provided for faculty 00 No 20 Don't know 10 Yes, equipment is insufficient 11 Yes, equipment is adequate 12 Yes, equipment is generous
40-41	Bibliographic and library facilities 00 No 20 Don't know 10 Yes, library facilities are unsatisfactory 11 Yes, library facilities are satisfactory 12 Yes, library facilities are excellent
42-43	Financial support is provided for purchase of equipment 00 No 20 Don't know 10 Yes, funds are insufficient 11 Yes, funds are satisfactory 12 Yes, funds are generous
44-45	Financial support is provided for travel to other research centers and professional meetings 00 No 20 Don't know 10 Yes, funds are insufficient 11 Yes, funds are satisfactory 12 Yes, funds are generous

Column	Description
46-47	Financial support is provided for publication costs 00 No 20 Don't know 10 Yes, funds are insufficient 11 Yes, funds are satisfactory 12 Yes, funds are generous
48-49	Financial support is provided for bringing research lecturers to campus 00 No 20 Don't know 10 Yes, funds are insufficient 11 Yes, funds are satisfactory 12 Yes, funds are generous
50-51	Financial support is provided for computing costs 00 No 20 Don't know 10 Yes, funds are insufficient 11 Yes, funds are satisfactory 12 Yes, funds are generous
52-53	Assistance Consulting help in formulating problem, design analysis, etc. 00 No 20 Don't know 10 Yes, assistance is insufficient 11 Yes, assistance is satisfactory 12 Yes, assistance is generous
54-55	Clerical and statistical assistance 00 No 20 Don't know 10 Yes, assistance is insufficient 11 Yes, assistance is satisfactory 12 Yes, assistance is generous
56-57	Secretarial and typing assistance 00 No 20 Don't know 10 Yes, assistance is insufficient 11 Yes, assistance is satisfactory 12 Yes, assistance is generous
58-59	Help in making application for research projects 00 No 20 Don't know 10 Yes, assistance is insufficient 11 Yes, assistance is satisfactory 12 Yes, assistance is generous
60-61	Help in developing, selecting, or using measuring and data-collecting devices 00 No 20 Don't know 10 Yes, assistance is insufficient 11 Yes, assistance is satisfactory 12 Yes, assistance is generous
62-63	Graduate Assistants # of graduate assistants you have
64	Their duties

Column	Description
	1 Teaching Assistant 2 Research Assistant 3 Teaching & Research 4 Other
65-66	# of hours per week
	Three most important objectives of the doctoral training in education (your school) (Item 17)
67	To prepare university or college administrator 0 Blank 1 Marked (x)
68	To prepare public school administrator 0 Blank 1 Marked (x)
69	To prepare university professors 0 Blank 1 Marked (x)
70	To prepare teachers for teacher's colleges 0 Blank 1 Marked (x)
71	To prepare public school teachers 0 Blank 1 Marked (x)
72	To prepare professional research workers 0 Blank 1 Marked (x)
73	To prepare educational specialists (counseling, reading, etc.) 0 Blank 1 Marked (x)
	Basis on which your graduate school selects people for admission to the doctoral program in education (Item 18)
74	Bachelor's degree 0 Blank 1 Marked (x)
75	Master's degree 0 Blank 1 Marked (x)
76	Examination 0 Blank 1 Marked (x)
77	Undergraduate record 0 Blank 1 Marked (x)
78	Teaching experience 0 Blank 1 Marked (x)

Column	Description
79	Other admission requirements 0 Blank 1 Marked (x)
C. 3rd Card:	
1-3	ID #
4	Card #
5-6	
7	In his future work, would the typical doctoral graduate in your area be required to conduct independent research? (Item 19) 0 No 1 Yes 2 Don't know
8	Do you believe that the typical doctoral graduate in your area is adequately prepared to do independent research? (Item 19) 0 No 1 Yes 2 Undecided
9	Is training for research an important part of the doctoral program in your Education Division? (Item 20) 0 No 1 Yes 2 Undecided
10	Within your Education Division, how much emphasis is given to research training? (Item 20) Research training receives emphasis equal to that given preparation for teaching or administration 0 Blank 1 Marked (x)
11	Research training is only a peripheral activity 0 Blank 1 Marked (x)
12	All doctoral students are prepared to be intelligent consumers and interpreters of research 0 Blank 1 Marked (x)
13	All doctoral students are prepared to be independent producers of research 0 Blank 1 Marked (x)

Column	Description
	What emphasis do you think should be given to research training in a School of Education? (Item 21)
14	Research training should receive emphasis equal to that given preparation for teaching or administratio 0 No 1 Yes 2 Don't know
15	Research training should be only a peripheral activity 0 No 1 Yes 2 Don't know
16	All doctoral students in education should be prepared to be intelligent consumers and interpreters of research 0 No 1 Yes 2 Don't know
17	All doctoral students should be prepared to be independent producers of research 0 No 1 Yes 2 Don't know
	Which of the following are objectives in the research training of the typical doctoral students in your department? (Item 22)
18	To read and understand the general and some of the technical professional literature 0 No 1 Yes 2 Don't know
19	To read and understand almost all of the technical professional literature 0 No 1 Yes 2 Don't know
20	To write research reports 0 No 1 Yes 2 Don't know
21	To collect, tabulate and analyze data on assigned problems 0 No 1 Yes 2 Don't know
22	To devise appropriate data-collection procedures & instruments 0 No 1 Yes 2 Don't know

Column	Description
23	To define researchable problems within a problem area 0 No 1 Yes 2 Don't know
24	To select and use appropriate statistical procedures 0 No 1 Yes 2 Don't know
25	To develop or derive new statistical procedures 0 No 1 Yes 2 Don't know
26	To devise research plans or strategy 0 No 1 Yes 2 Don't know
27	To design, execute, and interpret studies that are needed for practical solutions to immediate problems 0 No 1 Yes 2 Don't know
28	To design and carry out original studies that represent fundamental contributions to knowledge 0 No 1 Yes 2 Don't know
29	To direct the research of other people 0 No 1 Yes 2 Don't know
	Rank the five most important personal characteristics in the selection of people for concentrated research training (Item 23)
30	High intelligence
31	High scholastic record
32	Originality, creativity and imagination
33	Curiosity and enjoyment of intellectual exploration
34	Persistence in carrying projects to completion
35	Independence of thought and investigation
36	Knowledge of field in which he would do research
37	Mastery of research tools and techniques
38	Motivation to do research
39	Mastery of statistics

Column	Description
	How important do you think the following are in the training of graduate students for educational research work? (Item 24)
40	An institutional climate which favors research 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important
41	A faculty which itself is actively doing research 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important
42	Formal course work in research methodology 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important
43	Formal course work outside of education 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important
44	Advanced study in an academic subject matter area 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important
45	Seminars in research 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important
46	Internship experience in research 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important
47	Independent study 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important

Column	Description
48	Other (Item 24 Contin'd) 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important
	Rank order of the frequency of positions held now by those doctoral graduates in your area who have taken positions during the past five years (Item 25)
49	Public School - Administrator
50	Teacher's College - Administrator
51	University - Administrator
52	Public School - Teacher, Counselor, etc.
53	Teachers College - Teacher, Counselor, etc.
54	University - Teacher, Counselor, etc.
55	Public School - Researcher
56	Teacher's College- Researcher
57	University - Researcher
	Compare the students preparing for academic positions (research-teaching) in a university or college with those who will enter public school work (Item 26)
58	Are there differences in admission requirements? 0 No 1 Yes
59	Are there differences in the requirements to be met for the degree by these two groups. 0 No 1 Yes
60	What doctoral degree is granted for those entering public school work? 1 Ed. D. 2 Ph. D. 3 Ed. D. or Ph. D.
61	What doctoral degree is granted for those entering university work? 1 Ed. D. 2 Ph. D. 3 Ed. D. or Ph. D.

LIST OF BIVARIATE DISTRIBUTIONS EXHIBITING DIFFERENCES BETWEEN ADMINISTRATORS AND PROFESSORS THAT WERE STATISTICALLY SIGNIFICANT

Row Variable	Column Variable	Significance Level
Actual Time Teaching	Preferred Time Teaching	.01
" " "	Doing Research	.01
" " "	Is it important for you to do research	.10
" " "	Faculty research activity	.01
" " "	Most of research done by faculty members	.05
" " "	Outside grant	.01
" " "	Grant from the institution	.02
" " "	Typing assistance - research productivity	.10
" " Administr-	Preferred time administrating	.01
" " ating	Financial support for computing costs research productivity	.10
" " Research	Preferred time research	.01
" " "	Doing research	.01
" " "	Its importance in your field	.05
" " "	Faculty research activity	.10
" " "	Grant from the institution	.02
" " "	" " " outside	.01
" " "	Associates speak out for research - research productivity	.05
" " "	Financial support for publication costs - research productivity	.10
" " "	Help in preparing proposals for outside support - research productivity	.01
" " "	Typing assistance - research productivity	.05
Preferred Time Teaching	Attitude of school toward research	.10
"	Most of research done by research institute	.01
"	" " " " " graduate students	.10
"	Discussions of teaching practices - rank order of publications	.10
"	Associates speak out for research - research productivity	.02
Pref. Time Admin.	Its importance in your field	.10
" " "	Associates speak out for research - research productivity	.10
" " "	Reduced teaching load - research productivity	.10
" " "	Promotion and salary - " "	.05

Row Variable	Column Variable	Significance Level
Preferred Time Research	Doing research	.01
"	Is it important for you to do research?	.05
"	Most research done by research institute	.05
"	Grant from outside	.01
"	Associates speak out for research - research productivity	.01
"	Associates actively do research - research productivity	.01
"	Faculty meetings - research productivity	.05
Preferred Time Teaching	Library resources - " "	.01
"	Financial support for bringing research lecturers to campus - research productivity	.10
"	Typing assistance - " "	.05
"	Students actively interested in research as a future career - research productivity	.01
"	To prepare public school administration objectives	.10
"	To prepare teachers for teacher's college objectives	.02
"	To prepare public school teachers - objecjectives of educational doctoral training	.01
"	To prepare researchers - objectives of educational doctoral training	.05
Preferred Time Administrating	To prepare university administrators - objectives of educational doctoral training	.02
"	To prepare public school administrators objectives of educational doctoral training	.02
"	To prepare researchers - objectives of educational doctoral training	.05
"	To prepare education specialists - objectives of educational doctoral training	.02
Preferred Time Research	Space for research needs - research productivity	.05
"	Equipment for research - research productivity	.10
"	Library resources - research productivity	.05
"	Financial support for travel to research meetings - research productivity	.10
"	Financial support for publication costs - research productivity	.10
"	Consulting help in formulating problem, design, etc. - research productivity	.02
"	Clerical assistance - research productivity	.10
"	Help in preparing proposals - research productivity	.01
"	Help in developing measuring data-collecting devices - research productivity	.05

Row Variable	Column Variable	Significance Level
Preferred Time Research	To prepare public school administrators Objectives of educational doctoral training	.10
"	To prepare public school teachers - Objectives of educational doctoral training	.10
"	To prepare researchers - objectives of educational doctoral training	.01
"	To prepare education specialists - objectives of educational doctoral training	.01
Are you doing research now?	About equally a consumer and a producer - relation to research	.01
Are you doing research now?	Rank order of news reports produced by your school	.10
Are you doing research now?	Equipment for research - research productivity	.05
Are you doing research now?	Rank order of philosophical research	.10
Are you doing research now?	Research is not supported officially	.01
Are you doing research now?	Research is supported by a grant from the institution	.01
Are you doing research now?	Research is supported by a grant from an outside agency	.01
Primarily a consumer of research	About equally a consumer and a producer	.01
"	Research is supported by a grant from the institution	.01
"	Research is supported by a grant from an outside agency	.01
"	Financial support for travel to research meetings - research productivity	.10
Primarily a producer of research	About equally a consumer and a producer	.01
"	Research is supported by a grant from an outside agency	.01
Are you doing research now?	Consulting help in formulating problem, design, etc.	.05
"	Help in preparing proposals - research productivity	.02
"	Students actively interested in research as a future career - research productivity	.02
"	In his future work, would the typical doctoral graduate in your area be required to conduct independent research?	.10

Row Variable	Column Variable	Significance Level
Are you doing research now?	Actually how much emphasis is given to educational research training? Research training receives equal emphasis	.01
Primarily a consumer of research	Consulting help in formulating problem, design, etc. - research productivity	.10
"	Capable graduate assistance - research productivity	.05
"	Students actively interested in research as a future career - research productivity	.10
"	In his future work, would the typical doctoral graduate in your area be required to conduct independent research?	.10
"	Actually research training receives equal emphasis	.02
Primarily a producer of research	Students actively interested in research as a future career - research productivity	.05
Is it important for you to do research?	Attitude of school toward research	.01
"	Faculty research activity	.05
"	Financial support for purchase of equipment research productivity	.05
"	Library resources - research productivity	.01
"	Financial support for travel to research meetings - research productivity	.05
"	Financial support for publication costs - research productivity	.05
"	Financial support for bringing lecturers to campus - research productivity	.05
"	Consulting help in formulating problem, design, etc. - research productivity	.01
"	Help in preparing proposals - research productivity	.10
"	Typing assistance - research productivity	.05
"	Financial support for computing costs - research productivity	.01
"	Help in developing measuring and data-collecting devices - research productivity	.05
"	Computing facilities - " "	.10
"	Capable graduate assistance - research productivity	.10

Row Variable	Column Variable	Significance Level
How important is research in your field?	Attitude of your school	.01
"	Research is supported by a grant from the institution	.02
"	Associates who are actively doing research research productivity	.01
"	Reduced teaching load - research productivity	.02
"	Sabbatical leave - research productivity	.02
"	Administration recognition in terms of promotion, salary, etc. - research productivity	.01
"	Administration actively seeking funds for research - research productivity	.05
"	A formal organization for aiding faculty research - research productivity	.01
"	Space for research needs - research productivity	.01
"	Equipment for research - research productivity	.02
"	Library resources " "	.01
"	Financial support for purchase of equipment - research productivity	.02
"	Financial support for bringing lecturers to campus - research productivity	.05
"	Financial support for computing costs - research productivity	.01
"	Consulting help in formulating problem, design, etc. - research productivity	.01
"	Clerical assistance - research productivity	.01
"	Help in preparing proposals - research productivity	.10
"	Typing assistance - research productivity	.02
"	Computing facilities - " "	.01
"	Students actively interested in research as a future career - research productivity	.01
Attitude of school toward research	Financial support for travel to research meetings - research productivity	.02
"	Financial support for bringing lecturers to campus - research productivity	.02
"	Consulting help in formulating problem, design, etc. - research productivity	.05

Row Variable	Column Variable	Significance Level
Faculty research	Most of research done by faculty members	.01
" "	" " " " " grad. students	.01
" "	Research is supported by a grant from the institution	.10
" "	Research is supported by a grant from an outside agency	.02
" "	Administration recognition in terms of promotion, salary, etc. - research productivity	.05
" "	Equipment for research - research productivity	.05
" "	Consulting help in formulating problem, design, etc. - research productivity	.05
" "	Typing assistance - research productivity	.10
" "	Capable graduate assistance - research productivity	.10
" "	Students who are actively interested in research as a future career - research productivity	.05
Surveys - rank order	A formal organization for aiding faculty research - research productivity	.10
"	Equipment for research - research productivity	.10
Experimental studies rank order	Research is supported by a grant from the institution	.05
"	Associates who are actively doing research research productivity	.01
"	Equipment for research - research productivity	.10
Discussions of teaching - rank order	Associates whose research interests are similar to yours - research productivity	.10
"	Equipment for research - res. "	.10
"	Library resources - " "	.05
Discussions for the improvement of teaching - rank order	Research is supported by a grant from the institution	.01
Inspirational writing - rank order	Equipment for research - res. productivity	.10
"	Library resources " "	.02
"	Financial support for computing costs - research productivity	.01

Row Variable	Column Variable	Significance Level
News Report - rank order	Associates who publicly speak for research - research productivity	.10
"	Associates whose research interests are similar to yours - res. productivity	.02
"	Administration actively seeking funds for research - research productivity	.10
Book Review - rank	Financial support for purchase of equipment - research productivity	.10
Historical research rank	Research is supported by a grant from an outside agency	.10
" "	Sabbatical leave - research productivity	.05
Philosophical " rank	Research is supported by a grant from the institution	.01
" "	Associates who speak out for research - research productivity	.01
" "	Associates who are doing research - research productivity	.01
" "	Administration recognition in terms of promotion, salary, etc. - res. productivity	.10
" "	A formal organization for aiding research research productivity	.05
" "	Library resources - research productivity	.05
" "	Financial support for travel - res. "	.10
Testing programs produced by your school - rank order	Consulting help in formulating problem, design, etc.	.05
News Report - rank	Capable graduate assistance - res. produc.	.05
Book Review - rank	Help in preparing proposals - " "	.10
Historical research rank	Consulting help in formulating problem, design, etc. - research productivity	.10
" " "	Help in preparing proposals - res. produc.	.05
" " "	Computing facilities - " "	.05
" " "	Students interested in research as a future career - research productivity	.10
Philosophical research - rank	Help in preparing proposals - res. produc.	.05

Row Variable	Column Variable	Significance Level
Is it important for you to do research?	Research objectives of educational doctoral training - to prepare researchers	.10
"	In his future work, would the typical doctoral graduate in your area be required to do independent research?	.10
"	Actually all ed. doc. students are prepared to be independent producers of research	.10
"	Objectives - to read general literature	.05
"	" " " technical "	.05
"	" of research training - to write research reports	.01
"	Objectives - to collect and analyze data	.05
"	" " devise instruments	.02
"	" " define problems	.01
"	" " use appropriate statistical procedures	.02
"	Objectives - to devise research plans	.02
How important is research?	Is the typical doctoral graduate adequately prepared to do independent research?	.05
"	Is research training an important part of your educational doctoral program?	.01
"	Actually research training is only a peripheral activity	.10
"	Actually all ed. doc. students are prepared to be intelligent consumers of research	.02
"	Research training should receive equal emphasis	.10
"	Research training should be only a peripheral activity	.10
"	Objectives - to read general literature	.01
"	" " write research reports	.01
"	" " collect & analyze data	.05
"	" " devise instruments	.05
"	" " define problems	.01
"	" " use appropriate statistical procedures	.01
"	Objectives - to devise research plans	.01
"	" " carry out studies needed for practical solutions	.01

Row Variable	Column Variable	Significance Level
How important is research?	Objectives of research training - to carry out original studies	.05
"	Objectives - to direct research	.10
"	Faculty actively doing research	.02
"	Training - course work in res. methodology	.10
"	" - internship in research	.02
"	" - independent studies	.05
Attitude of school towards research	Is research training an important part of your educational doctoral program?	.01
"	Actually research training is only a peripheral activity	.01
"	Actually all doctoral students are prepared to be intelligent consumers of research	.10
"	Objectives of research training - to read general literature	.01
"	Objectives - to read technical literature	.10
"	" " write research reports	.01
"	" " collect & analyze data	.01
"	" " devise instruments	.01
"	" " define problems	.01
"	" " use appropriate statistical procedures	.01
"	Objectives - to devise research plans	.02
"	" " carry out studies needed for practical solutions	.01
Faculty research activity	In his future work, would the typical doctoral graduate in your area be required to do independent research?	.10
"	Is the typical doctoral graduate adequately prepared to do independent research?	.01
"	Actually all doctoral students are prepared to be intelligent consumers of research	.10
"	All ed. doctoral students should be prepared to be independent producers of research	.10
"	Objectives - to read general literature	.05
"	" " write research reports	.05
"	" " define problems	.02
"	" " use appropriate statistical procedures	.02
"	Objectives - to devise research plans	.05

Row Variablè	Column Variable	Significance Level
Faculty research activity	Objectives of research training - to carry out studies needed for practical solutions	.10
"	Objectives - to direct research	.01
Research is not supported officially	Objectives - to devise research plans	.05
Research is supported by a grant from the institution	In his future work, would the typical doctoral graduate in your area be required to do independent research?	.10
"	Actually research training receives equal emphasis	.02
"	Research training should receive equal emphasis	.10
"	All ed. doc. students should be prepared to be independent producers of research	.10
Research is supported by a grant from an outside agency	Is the typical doc. grad. in your area prepared adequately to do independent res.	.10
"	Actually res. training receives equalemph.	.01
"	Objectives - to develop new statistical procedures	.10
"	Objectives - to carry out studies needed for practical solutions	.10
Examination as a basis for selecting ed. doc. students	Independence of thought - rank	.05
"	Curiosity - rank	.10
Obj. of ed. doc. trg. to prepare university administrators	Rank order of teacher's college instructors, the position held now by those doc. grad.	.02
Obj. of ed. doc. trg. to prepare public school administrators	Institutional climate which favors research educational research training	.01
"	Rank order of public school administrators, the position held now by those doc. grad.	.01
Obj. of ed. doc. trg. to prepare univ. prof.	Rank order of public school teachers	.10

Row Variable	Column Variable	Significance Level
Obj. of ed. doc. trg. - to prepare educ. specialists	Institutional climate which favors research - ed. res. training	.10
Actually research training receives equal emphasis	Rank order of teacher's college researchers	.02
Actually all ed. doc. students are prepared to be intelligent consumers of research	Rank order of university researchers	.10
Actually all ed. doc. students are prepared to be independent producers of research	Rank order of teacher's college administrators	.02
"	Rank order of teacher's college researchers	.10
Research training *should* receive equal emphasis	Rank order of teacher's college administrators	.05
Are you doing research now?	Primarily a consumer of research	.01
"	" a producer " "	.05
"	About equally a consumer & producer	.01
"	How important is research in your field?	.02
"	Faculty research activity	.05
"	Most of research done by faculty members	.01
"	" " " " " institute	.05
"	" " " " " grad. students	.10
How important is research in your field?	A faculty which is actively doing research ed. res. training	.02
"	Course work in research methodology - ed. res. training	.10
"	Internship - ed. res. training	.02
"	Independent studies - ed. res. training	.05
Relation to research - primarily a consumer of res.	Primarily a producer of research	.01

Row Variable	Column Variable	Significance Level
Primarily a producer of research	About equally a consumer & a producer	.01
Res. productivity Administrative recognition in terms of promotion, salary, etc.	Actually research is an important consideration in terms of promotions, salary,	.02
Res. productivity - Financial support for bringing research lecturers to campus	Actually financial support for bringing lecturers to campus is available	.05
Res. productivity Financial support for computing costs	Actually financial support for computation is available	.01
Res. productivity Consulting help in formulating problem, design, etc.	Actually consulting help in formulating problem, design, etc. is provided	.02
Clerical assistance - res. prod.	Actually clerical assistance is provided	.05
Res. productivity Help in preparing proposals for outside support	Actually help in preparing proposals is provided	.02
Res. productivity Typing assistance	Actually typing assistance is provided	.01
Res. productivity Help in developing measuring & data-collecting devices	Actually help in developing measuring & data-collecting devices is available	.02
Res. productivity Financial support for purchase of equipment	Yes, financial support is provided for purchase of equipment	.01
Res. productivity Financial support for computing costs	Yes, financial support is provided for computing costs	.01
Res. productivity Clerical assistance	Yes, clerical assistance is provided	.02
Res. productivity Help in developing Measuring & data-collecting devices	Yes, help is provided in developing measuring & data-collecting devices	.01

APPENDIX H

SUMMARY OF GRADUATE STUDENT QUESTIONNAIRE

BIVARIATE DISTRIBUTIONS

APPENDIX H

Summary of Graduate Student Questionnaire Responses
Bivariate Distributions

1. Graduate Student Questionnaire Code Sheets.
2. List of Bivariate Distributions Exhibiting Differences Between Ed. D. and Ph. D. Candidates.

Graduate Student Questionnaire Code Sheets

Column	Description
1-3	ID #
4-6	
7	Degree sought (Item 1) 1 Ed. D. 2 Ph. D. 3 Ed. S. (Educational Specialist)

Column	Description
8-9	Major Field of Study (Item 1) 01 Adult Education 02 Audio-Visual Education 03 Business Education (including Employee Training) 04 Counseling and Guidance; School Personnel Services 05 Curriculum 06 Educational Psychology; School Psychology (including Combined Education & Psychology Program) 07 Elementary Education 08 General Field of Education; Foundations of Education; Educational Leadership 09 Higher Education 10 History and Philosophy of Education 11 Physical Education 12 Reading; Speech 13 Research (Statistics, Educational Measurement) 14 School Administration 15 Secondary Education 16 Special Education 17 Vocational Education 18 Industrial Arts 19 Teacher Education 20 Comparative Education 21 Math Education 22 Science Education
10-11	Minor Field of Study (Item 1) Same as above plus 23 Areas outside of Education
12-13	Expected Year of Completing the Doctorate (Item 1)
14-15	What type of position do you hope to obtain after graduation? (Item 2) 01 College or University Instructor 02 Teacher Trainer 03 Public School Teacher 04 Counselor 05 School Psychologist 06 Researcher 07 Educational Editor 08 University Librarian 09 Officer or Specialist of Professional Association 10 College or University Administrator; Dean of Academic Studies

Column	Description
	11 Dean of Students; Dean of Men 12 Department Head of a College or University 13 Director, Coordinator, or Supervisor of Student Teaching 14 Research Director 15 Curriculum Director 16 Director or Supervisor of Counseling Services 17 Director of Special Education Program 18 Public School Administrator; Superintendent; Assistant Superintendent; Supervisor 19 High School Principal 20 Elementary School Principal 21 Educational TV Director; Audio-Visual Director 22 Training Director (Industry or Government) 30 Undecided
16-17	Will your future work probably require competence in research? (Item 3) 00 No 11 Yes, less than 25% of the time 12 Yes, 25-49 % of the time 13 Yes, 50-74 % of the time 14 Yes, 75-90 % of the time 15 Yes, more than 90% of the time 20 Don't know
18	Would you enjoy doing research as a part of your future work? (Item 4) 0 No 1 Yes 2 Undecided
	What has been the extent of your experience with educational research? (Item 5)
19	Results of research are regularly discussed in graduate education courses 0 Blank 1 Marked (x)
20	The reading of research is a requirement in graduate education courses 0 Blank 1 Marked (x)
21	Conducting research studies is a requirement in graduate education courses
22-23	Formal courses in research methodology 00 Blank 1X Marked (x indicates the number of courses)

Column	Description
24-25	Seminars in research 00 Blank 1x Marked (x indicates the number of seminars)
26	Graduate assistantship in research 0 Blank 1 Marked (x)
27	Thesis 0 Blank 1 Marked (x)
28	Other 0 Blank 1 Marked (x)
29	To what extent do you believe yourself prepared to do independent research in your area? (Item 6) 0 Do not feel prepared to do independent research 1 Need substantial help in designing and analyzing studies 2 Need some help in designing and analyzing studies 3 Completely prepared to do independent research
	What emphasis do you think should be given to research training in a school of education? (Item 7)
30	Research training should receive emphasis equal to that given preparation for teaching or administration 0 No 1 Yes 2 Don't know
31	Research training should be only a peripheral activity in a school of education 0 No 1 Yes 2 Don't know
32	All doctoral students in education should be prepared to be intelligent consumers and interpreters of research 0 No 1 Yes 2 Don't know
33	All doctoral students should be prepared to be independent producers of research 0 No 1 Yes 2 Don't know

Column	Description
	How much emphasis is actually given to research training within your school of education? (Item 8)
34	Research training receives emphasis equal to that given preparation for teaching or administration 0 No 1 Yes 2 Don't know
35	Research training is only a peripheral activity in this school of education 0 No 1 Yes 2 Don't know
36	All doctoral students in education are prepared to be intelligent consumers and interpreters of research 0 No 1 Yes 2 Don't know
37	All doctoral students are prepared to be independent producers of research 0 No 1 Yes 2 Don't know
	How important do you think the following are in the preparation of students for educational research work? (Item 9)
38	An institutional climate which favors research 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important
39	A faculty which itself is actively doing research 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important
40	Formal course work in research methodology 0 Trivial 1 Sometimes Useful 2 Useful 3 Important 4 Very Important

Column	Description
41	Formal course work outside of education
	0 Trivial
	1 Sometimes Useful
	2 Useful
	3 Important
	4 Very Important
42	Advanced study in an academic subject matter
	0 Trivial
	1 Sometimes Useful
	2 Useful
	3 Important
	4 Very Important
43	Seminars in research
	0 Trivial
	1 Sometimes Useful
	2 Useful
	3 Important
	4 Very Important
44	Internship experience
	0 Trivial
	1 Sometimes Useful
	2 Useful
	3 Important
	4 Very Important
45	Independent study
	0 Trivial
	1 Sometimes Useful
	2 Useful
	3 Important
	4 Very Important
46	Other
	0 Trivial
	1 Sometimes Useful
	2 Useful
	3 Important
	4 Very Important
47	How would you describe the attitude of your school of education toward research? (Item 10)
	0 Unfavorable
	1 Indifferent
	2 Favorable
	Rank order of those who do the educational research at your institution (Item 11)
48	Graduate Students
49	Individual Faculty Members
50	A Formal Organization
51	Other

Column	Description
52	Faculty research activity in this school is (Item 12): 0 Underemphasized 1 Appropriately emphasized 2 Overemphasized
	Rank order of the five most important personal characteristics of a successful educational researcher (Item 14)
53	High intelligence
54	High scholastic record
55	Originality, creativity, and imagination
56	Curiosity and enjoyment of intellectual exploration
57	Motivation to do research
58	Persistence in carrying projects to completion
59	Independence of thought and investigation
60	Knowledge of field in which he would do research
61	Mastery of statistics
62	Mastery of research tools and techniques
63	Other
	From the following list, check those adjectives that you would use to describe educational research (Item 15)
64	Useful 0 Blank 1 Marked (x)
65	Practical 0 Blank 1 Marked (x)
66	Exciting 0 Blank 1 Marked (x)
67	Original 0 Blank 1 Marked (x)
68	Routine 0 Blank 1 Marked (x)
69	Amateurish 0 Blank 1 Marked (x)
70	Theoretical 0 Blank 1 Marked (x)
71	Creative 0 Blank 1 Marked (x)

Column	Description
72	Inconsequential 0 Blank 1 Marked (x)
73	Superficial 0 Blank 1 Marked (x)
74	Valuable 0 Blank 1 Marked (x)
75	Scholarly 0 Blank 1 Marked (x)
76	Worthless 0 Blank 1 Marked (x)
77	Rigorous 0 Blank 1 Marked (x)
78	Interesting 0 Blank 1 Marked (x)
79	Important 0 Blank 1 Marked (x)
80	Scientific 0 Blank 1 Marked (x)

LIST OF BIVARIATE DISTRIBUTIONS
EXHIBITING DIFFERENCES BETWEEN
ED. D. AND PH. D. CANDIDATES

Row Variable	Column Variable	Significance Level
To what extent do you believe yourself prepared to do independent research in your area?	Actual situation - Research training receives equal emphasis	.05
Research training should receive emphasis equal to that given preparation for teaching or administration	Actual situation - Research training receives equal emphasis	.01
Research training should be only a peripheral activity in a school of Ed.	Same as above	.10
Results of research are regularly discussed in grad. ed. courses - Experience with ed. research	Actual situation - Research training is only a peripheral activity	.01
Reading of research is a requirement in grad. ed. courses - Experience with ed. research	Same as above	.05
Conducting research studies is a requirement in grad. ed. courses - Exper. with ed. research	Same as above	.10
Seminars in Research Exper. with Ed. Res.	Same as above	.01
Research training should be only a peripheral activity in a school of education	Same as above	.01

Row Variable	Column Variable	Significance Level
Results of res. are regularly discussed in grad. ed. courses - Exper. with ed. res.	Actual situation - All doctoral students are prepared to be consumers of research	.01
Reading of res. is a requirement in grad. ed. courses Exper. with ed. res.	Same as above	.02
Conducting research studies is a requirement in grad. ed. courses - Exper. with ed. res.	Same as above	.02
Seminars in research Exper. with ed. res.	Same as above	.05
Graduate assistantship in research - Exper. with ed. res.	Same as above	.05
Other - Exper. with ed. res.	Same as above	.05
Reading of res. is a requirement in grad. ed. courses - Exper. with ed. res.	Actual situation - All doctoral students are prepared to be producers of research	.05
Conducting research studies is a requirement in grad. ed. courses - Exper. with ed. res.	Same as above	.02
Grad. assistantship in res. - Exper. with ed. res.	Institutional climate which favors res.	.01
Res. training should receive emphasis equal to that given preparation for teaching or admin.	Same as above	.01

Row Variable	Column Variable	Significance Level
Research training should receive emphasis equal to that given preparation for teaching or admin.	Institutional climate which favors res.	.01
Res. training should be only a peripheral activity in a school of ed.	Same as above	.01
All doctoral students in education should be prepared to be intelligent consumers and producers of res.	Same as above	.05
All doctoral students should be prepared to be independent producers of research	Same as above	.05
Grad. assistantship in res. - Exper. with ed. res.	Faculty which itself is actively doing research	.01
To what extent do you believe yourself prepared to do independent res. in your area?	Same as above	.10
Res. training should receive emphasis equal to that given prep. for tchg. or admin.	Same as above	.01
Res. training should be only a peripheral activity in a school of ed.	Same as above	.01
Rank order of grad. students doing res.	Experience with ed. research - Thesis	.01

Row Variable	Column Variable	Significance Level
Rank order - Faculty members doing research	To what extent do you believe yourself prepared to do independent research?	.01
Same as above	All doctoral students should be intelligent consumers of research	.01
Same as above	Actual situation - Research training is only a peripheral activity	.02
Same as above	Actual situation - all doctoral students are prepared to be consumers of research	.01
Same as above	Actual situation - all doctoral students are prepared to be independent producers of research	.02
Rank order - a formal organization doing res.	Experience with ed. res. - Formal courses in research methodology	.05
Same as above	Experience with ed. res. - Seminars in research	.01
Same as above	Experience with ed. res. - graduate assistantship	.01
Rank order - personal characteristics - High intelligence	Experience with ed. res. - Results of research are discussed in grad. ed. courses	.10
Rank order of personal characteristics of a successful ed. researcher - High scholastic record	Actual situation - Research training receives equal emphasis	.10
Same as above	Actual situation - Res. training is only a peripheral activity	.02
Rank order of pers. char. of a successful researcher, Originality -creativity	Research training should receive equal emphasis	.10

Row Variable	Column Variable	Significance Level
Rank order of pers. char. of a successful researcher - Curiosity	Actual situation - research training is only a peripheral activity	.05
Rank order of pers. char. of a suc. ed. researcher Motivation to do res.	Experience with ed. res. - Results of research are discussed in grad. ed. courses	.10
Same as above	Exp. with ed. res. - Conducting res. is a requirement in grad. ed. courses	.10
Same as above	Exp. with ed. res. - Seminars in research	.10
Same as above	To what extent do you believe yourself prepared to do independent research?	.10
Rank order of pers. char. of a suc. ed. researcher Persistence	Same as above	.10
Rank order of pers. char. of a suc. ed. researcher Mastery of Statistics	All doctoral students should be consumers of research	.10
Rank order of pers. char. of a suc. ed. researcher Mastery of res. tools	Exp. with ed. res. - Grad. assistantship	.10
Same as above	Act. sit. - All doctoral students are prepared to be producers of research	.10
Rank order of pers. char. of a suc. ed. researcher Other	To what extent do you believe yourself prepared to do independent research?	.01
Same as above	All doctoral students should be consumers of research	.01
Same as above	Actual situation - Research training receives equal emphasis	.05

Row Variable	Column Variable	Significance Level
Rank order of a suc. researcher - High intelligence	Rank order - An organization doing research	.05
Same as above	Rank order - Other doing research	.01
Rank order of a suc. researcher - High scholastic record	Other factor in ed. research training	.05
Rank order of a suc. researcher - Originality	Internship	.05
Rank order of a suc. researcher - Motivation to do research	Rank order - Other doing research	.10
Rank order of a suc. researcher - Persistence	Rank order - Faculty members doing res.	.01
Rank order of a suc. researcher - Mastery of statistics	Same as above	.05
Rank order of a suc. researcher - Mastery of research tools	Same as above	.05
Rank order of a suc. researcher - Other	Other factor in ed. res. training	.01
Same as above	Rank order - Fac. mem. doing res.	.01
Same as above	" " An org. doing res.	.01
Same as above	" " Other " "	.01
Same as above	Faculty research	.05
Attitude of school towards res.	Adjective describing ed. res. - Routine	.10
Same as above	" " " " Creative	.05
Faculty members doing research	Other factors in ed. res. training	.10

Row Variable	Column Variable	Significance Level
Rank order - Other doing research	Independent study	.10
Same as above	Other factors in ed. res. training	.02
Faculty research	Attitude of school toward research	.01
Formal courses in Res. Methodology - Exper. with ed. res.	Course work in res. methodology	.01
All doc. students should be prepared to be independent producers of research	Same as above	.01
All doc. students are prepared to be independent producers of research	Same as above	.10
Conducting res. studies is a requirement in grad. ed. courses - Exper. with ed. res.	Course work outside of education	.10
Formal courses in res. methodology - Exper. with ed. res.	Same as above	.01
Res. trg. should receive emphasis equal to that given prep. for teaching or admin.	Same as above	.01
Seminars in research - Exper. with ed. res.	Advanced study in a subject matter	.10
To what extent do you believe yourself prep. to do indep. res. in your area?	Same as above	.05
All doc. students should be prep. to be indep. producers of research.	Same as above	.01

Row Variable	Column Variable	Significance Level
Seminars in research - Exper. with ed. res.	Seminars in research	.01
Grad. assistantship in res. - Exper. with ed. res.	Same as above	.01
Res. training should receive emphasis equal to that given prep. for teaching or admin.	Same as above	.05
Res. training should be only a peripheral activity in a school of education	Same as above	.05
All doc. students should be prep. to be indep. producers of research	Same as above	.01
Res. training is only a peripheral activity in this school of ed.	Same as above	.01
All doc. students are prep. to be indep. producers of research	Same as above	.10
Formal courses in res. methodology - Exper. with ed. res.	Internship	.05
Grad. assistantship in research - Exper. with ed. res.	Same as above	.01
Res. training should receive equal emphasis (teaching or admin.)	Same as above	.05
Res. training should be only a peripheral activity in a school of education	Same as above	.10

Row Variable	Column Variable	Significance Level
Conducting research studies is a requirement in grad. ed. courses - Exper. with ed. res.	Importance of independent study	.05
Seminars in research Exper. with ed. res.	Same as above	.02
Thesis - Experience with ed. research	Same as above	.05
Other - Experience with ed. research	Same as above	.10
Res. training should receive emphasis equal that given prep. for teaching or admin.	Same as above	.01
Res. training should be only a peripheral activity in a school of education	Same as above	.01
All doc. students in ed. should be prep. to be intelligent interpreters of research	Same as above	.05
All doc. students should be prep. to be indep. producers of research	Same as above	.10
Res. training is only a peripheral activity in this school of ed.	Same as above	.10
Other - Exper. with ed. research	Other factors important in ed. res.	.01
Results of res. are discussed in grad. ed. courses - Exper. with ed. research	Attitude of school toward research	.01

Row Variable	Column Variable	Significance Level
Conducting research studies is a requirement in grad. ed. courses - Exper. with ed. research	Attitude of school toward research	.01
Res. training receives emphasis equal to that given prep. for teaching or administration	Same as above	.01
Res. training is only a peripheral activity in this school of ed.	Same as above	.01
All doc. students in ed. are prepared to be intelligent consumers and interpreters of research	Same as above	.01
All doc. students are prepared to be independent producers of research	Same as above	.01

APPENDIX I

T. C. Chamberlin

Multiple Working Hypotheses

T. C. Chamberlin - Multiple Working Hypotheses

T. C. Chamberlin, "Multiple Working Hypotheses" indicates that there are two fundamental classes of study: "one consists in attempting to follow by close imitation the processes of previous thinkers, or to acquire by memorization the results of their investigations. It is merely secondary, imitative, or acquisitive study. The other class is primary or creative study ... the endeavor is to think for one's self ... It is not necessary to this habit of study that the subject-material should be new; but the process of thought and its results must be independent, not the mere following of previous lines of thought ending in predetermined results ...

"As in the earlier days, so still, it is the habit of some to hastily conjure up an explanation for every new phenomenon that presents itself. Interpretation rushes to the forefront as the chief obligation pressing upon the putative wise man. Laudable as the effort at explanation is in itself, it is to be condemned when it runs before a serious inquiry into the phenomenon itself. A dominant disposition to find out what it is, should precede and crowd aside the question, commendable at a later stage, 'How come this is so?' First full facts, then interpretations.

Premature Theories: "It is not the slowness with which conclusions are arrived at that should give satisfaction to the moral sense, but the thoroughness, the completeness, the all-sidedness, the impartiality of the investigation."....

"Briefly summed up, the evolution is this: a premature explanation passes into a tentative theory, then into an adopted theory, and then into a ruling theory."

"When the last stage has been reached, unless the theory happens, perchance, to be the true one, all hope of best results are gone. To be sure, truth may be brought forth by an investigator dominated by a false ruling idea. His very errors may stimulate investigation on the part of others. But this condition is an unfortunate one." ...

Ruling Theories Linger

"... the method of the ruling theory occupied a chief place during the infancy of investigation. It is an expression of the natural infantile tendencies of the mind ..."

"Unfortunately it did not wholly pass away with the infancy of investigation, but has lingered along in individual instances to the present day, ..."

"So long as intellectual interest dealt chiefly with the intangible, so long it was possible for this habit of thought to survive, and to maintain its dominance, because the phenomena themselves, were being largely subjective, were plastic in the hands of the ruling idea; but so soon as investigation turned itself earnestly to an inquiry into natural phenomena, whose manifestations are tangible, whose products are rigid, whose laws are rigorous, the defects of the method became manifest ..."

"The first great endeavor repressive. The advocates of reform insisted that theorizing should be restrained and the efforts directed to the simple determination of facts. The effort was to make scientific study factitious instead of causal." ...

"The inefficiency of this simply repressive reformation becoming apparent, improvement was sought in the method of the working hypothesis.... The working hypothesis differs from the ruling theory in that it is used as a means of determining facts, and has for its chief function the suggestion of lines of inquiry; the inquiry being made, not for the sake of the hypothesis, but for the sake of facts. Under the method of the ruling theory, the stimulus was directed to the finding of facts for support of the theory. Under the working hypothesis, the facts are sought for the purpose of ultimate induction and demonstration, the hypothesis being but a means for more ready development of facts and their relations, and the arrangement and preservation of material for the final induction."

A Family of Hypotheses

"In following a simple hypothesis, the mind is presumably led to a single explanatory conception. But an adequate explanation often involves the coordination of several agencies, which enter into the combined result in varying proportions. The time explanation is therefore necessarily complex. Such complex explanations of phenomena are specially encouraged by the method of multiple hypotheses, and constitute one of its chief merits. We are so prone to attribute a phenomenon to a single cause, that, when we find an agency present, we are liable to rest satisfied therewith, and fail to recognize that it is but one factor, ..., in the accomplishment of the total result." Chamberlin illustrates by using the question of origin of the Great Lakes--explanations involving blocked river valleys, glacial excavation, also earth's crust flexed downward beneath these basins. All of these must be considered and possibly supplemented by others.

"The problem, therefore, is the determination not only of the participation, but of the measure and the extent of each agency in the production of the complex result." ....

"A special merit of the method is that by its very nature it promotes thoroughness. The value of a working hypothesis lies largely in its suggestiveness of lines of inquiry that might otherwise be overlooked. Facts that are trivial in themselves are brought into significance by their bearings upon the hypothesis, and by their causal indications."

Drawbacks

Difficulty in use with young students. "It is far easier, and I think in general more interesting, for them to argue a theory or accept a simple interpretation than to recognize and evaluate the several factors which the true elucidation may require....." The complex and the quantitative do not fascinate the young student as they do the veteran investigator.

Multiple Hypotheses and Practical Affairs

..."In education, as in investigation, it has been much the practice to work a theory. The search for instructional methods has often proceeded on the presumption that there is a definite patent process through which all students might be put and come out with results of maximum excellence; and hence pedagogical inquiry in the past has largely concerned itself with the inquiry, "What is the best method?" rather than with the inquiry, "What are the special values of different methods, and what are their several advantageous applicabilities in the varied work of instruction?"...

"Just as the investigator armed with many working hypotheses is more likely to see the true nature and significance of phenomena when they present themselves, so the instructor equipped with a full panoply of hypotheses ready for application more readily recognizes the actuality of the situation, more accurately measures its significance, and more appropriately applies the methods which the case calls for."...